

NO-A165 931 PAX ECONOPACK ECONOMIC ANALYSIS PACKAGE USER'S MANUAL  
(U) ARMY ENGINEER DIV HUNTSVILLE AL H W NASON JAN 86  
HNDSP-86-117-ED-ES

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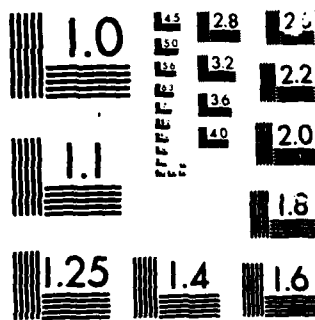
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**US Army Corps  
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Huntsville Division

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~~FEBRUARY~~ 1986

ECONOMIC ANALYSIS  
MILITARY CONSTRUCTION

PREPARED BY:  
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# ECONPACK

## USER'S MANUAL

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## CHAPTER 1 INTRODUCTION

### 1 INTRODUCTION

1.1 Introduction to ECONPACK. The Army, like other institutions, is confronted by the basic economic problem of scarcity. Resource and budgetary limitations make it impossible to undertake all actions which are deemed desirable, thus necessitating choices among alternative uses of resources and funds. An economic analysis (EA) helps to determine which, among various alternatives, is the economically "best" course of action for achieving a given objective. ECONPACK is a software package developed to facilitate performance of EAs for Department of the Army military construction projects.

ECONPACK provides simple automated assistance in performing the necessary calculations and in producing certain specified report formats for EAs. It can also be used for the performance of sensitivity analyses, which are especially useful in situations involving substantial uncertainty about future costs.

ECONPACK is available on the PAX-TYMSHARE system. If a problem is incurred in running this program or in understanding what the program wants for input, contact Huntsville Division - ECONPACK Computer Assistance - AV 742-5266, FTS 873-5266, or COMM (205) 895-5266, or PAX ID of BIRD.

1.2 Purpose. The immediate purpose of the ECONPACK program is to assist in the performance of economic and sensitivity analyses for Department of the Army military construction projects.

Advantages of using a computer program for doing EA calculations include:

- A. The ability to do repetitions of calculations accurately and with relative ease.
- B. The ability to test the implications of cost projections by incorporating sensitivity analysis into the economic analysis process.
- C. The ability to generate standardized reporting formats for results.

Additionally, the ECONPACK program is structured so that:

- A. Individuals having limited expertise in economic techniques can successfully produce EAs.

- B. EA output can be automatically added to a DD Form 1391 prepared via the PAX System's DD Form 1391 Processor.

Use of ECONPACK in performance of EAs is beneficial for personnel at the preparation level as well as the review level for funding request documentation. In this regard, the following broad purposes of ECONPACK are particularly important:

- A. To increase the effectiveness of the economic analyses prepared at installations and reduce the effort required by regenerations that would otherwise be necessary to bring the analyses up to OSD and Congressional standards.
- B. To minimize the frustration generated at preparation levels by reducing the number of times an analysis is returned for regeneration.
- C. To increase the effectiveness of economic analyses in minimizing the life cycle costs of constructing and operating Army installation facilities.
- D. To increase the effectiveness of documenting and communicating Army construction needs to OSD and the Congress.

EAs are intended to identify the least costly alternative to fulfill a construction requirement. ECONPACK is intended to contribute to the effectiveness and efficiency with which EAs are conducted.

### 1.3 Economic Analysis

1.3.1 The Meaning of Economic Analysis. Economic scarcity requires that choices be made in the use of resources. In general, economic analysis refers to an examination or application of the process by which such choices are made. Economists have developed standardized concepts, techniques, and principles which serve to rationalize and simplify the decision-making process. An economic analysis for the Army's military construction program employs the methodology of economics to systematically evaluate the economic aspects of a situation of choice and to determine the optimal course of action.

There are, of course, many contexts in which EAs are necessary or appropriate. Military construction EAs typically address the question of which of two or more alternatives will best accomplish a given objective. The alternatives are mutually exclusive in the sense that which ever alternative is chosen will adequately accomplish the objective, thereby eliminating the need

to also adopt any other alternative. The optimal (or economically best) solution is to select the alternative which, in comparison with the other alternatives, yields one or more of the following:

- A. The same benefits at less cost.
- B. Greater benefits at the same cost.
- C. A higher ratio of benefits to cost.

The preferred alternative, in other words, will normally be the one which provides the greatest net benefits (i.e. benefits minus costs).

The logic of the EA process allows for variability of both benefits and costs among the alternatives under consideration. In practice, however, most military construction EAs take the form of a choice among mutually exclusive alternatives which produce equivalent benefits or effects, but which have different overall cost levels. In a situation of this sort, the least costly alternative is the most economical. The design of ECONPACK is oriented to this approach to EAs.

1.3.2 The Economic Analysis Process. A comprehensive EA consists of seven basic components:

- A. Establishment and statement of objective.
- B. Identification of alternatives.
- C. Formulation of assumptions.
- D. Determination of costs and benefits for each alternative.
- E. Comparison of alternatives.
- F. Performance of sensitivity analysis.
- G. Report of results and recommendations.

1.3.2.1 Establishment and Statement of Objective. The objective is the result to be achieved; that is, it states what the alternatives are to accomplish. The statement of the objective should clearly define and quantify (to the extent possible) the function to be accomplished. Ideally, the statement of the objective should not presume a specific means of achievement (i.e., course of action to bring about the desired result). If such a presumption is made, the statement of the objective tends to undermine



the analytical purpose of the EA by pre-judging the result. Compare, for example, the following statements of objectives:

- A. To provide housing for 100 unaccompanied officers.
- B. To construct a 100-person Unaccompanied Officers Quarters.

Statement A is preferred because it does not preclude a conclusion to construct a 100-person Unaccompanied Officers Quarters; it allows for the evaluation of alternative means of housing provision.

A quantitative statement of the desired effect or objective is beneficial because it provides an explicit test of the adequacy of possible alternative courses of action. A proposed alternative may not be a viable option even if it has large net benefits if it is judged inadequate to fully meet an actual need. For example, a bridge with the capacity to support 15 tons may have a large net benefit, but is inadequate if there is a real need to transport 20-ton objects across the river.

Establishment of-and perhaps the statement of-the objective is often a policy matter which lies beyond the scope of the individual responsible for an EA. The "analyst", however, needs to recognize the significance of this step in the EA process.

1.3.2.2 Identification of Alternatives. After the objective is established and properly stated, the next step is to consider all reasonable ways of satisfying that objective. Since the EAs basic purpose is to help the decision-maker allocate resources efficiently, it is vital that careful attention be given to identification of all possible alternatives which could be optimal. The recommendation resulting from the EA will, after all, come from among those options evaluated.

In order for a possible alternative to be considered reasonable, it should be consistent with Army regulations and legal requirements. Adequacy and economic feasibility are other key considerations in identification or definition of reasonable alternatives. Adequacy refers to the capacity of the potential alternative to meet the actual scope or objective. For a potential alternative to be economically feasible, it must be compatible with funding realities.

1.3.2.3 Formulation of Assumptions. EAs are forward-looking in the sense that they are focused on current decisions which leave benefit and cost implications for future years. To the extent possible, EAs should be based on objective "facts." The future, however, is not known completely and with certainty. Therefore, it is often necessary to make some assumptions about the future

in order to proceed with an EA. Although some assumptions may be unavoidable, the analyst needs to keep in mind the possibility that the specific assumptions incorporated in the analysis may prove to be incorrect. This possibility provides the rationale for performance of sensitivity analysis as part of a comprehensive EA.

Examples of the kinds of assumptions which may be necessary in an EA include: the functional life of an asset, the level or extent of future requirements for a particular function, and the usefulness of a facility after the present objective is fulfilled. Although these assumptions are made with regard to an uncertain future, they need not be made arbitrarily. Fortunately, it is often possible to base these assumptions (or "estimates") on historical or technical factual information.

#### 1.3.2.4 Determination of Cost and Benefits For Each Alternative.

In practice, this step is often the most difficult and time-consuming component of an EA. The exact information needed will depend on the nature of the problem. The analyst must decide what data are needed, how relevant data are to be collected and documented, and when the data in-hand are sufficiently reliable to be used in an EA.

This fourth component of the EA process is closely related to the issue of assumptions just discussed. The assumptions which must be made to proceed with an EA involve costs and benefits. Conceptualizing assumptions separately is useful, however, because it serves to make the analyst aware of the care which should be used in interpreting results. For example, although cost figures for various expense categories are stated in dollar terms and aggregated regardless of whether they are actually known or estimated, the interpretation given to the aggregated costs is likely to be affected by the degree of uncertainty involved.

Costs and benefits must be determined for the entire useful life of the project. Since timing is important in investment decision making, appropriate estimates are needed for the year in which a cost is to be incurred or a benefit is to be received. Even if actual dollar amounts are known, it should be realized that assumptions may be necessary with respect to timing. While conceptual separation of assumptions from known information is desirable, functional overlap between assumptions and data collection is inevitable in most cases.

The costs and benefits associated with each alternative under consideration should be quantified whenever possible, so they may be systematically included in the EA calculations. Quantification, however, may not be possible in all cases. When meaningful quantification is not possible, the analyst should still attempt

to document significant (nonquantifiable) costs and benefits so that these may be considered when arriving at alternative courses of action.

1.3.2.5 Comparison of Alternatives. Since the aim of an EA is normally to choose among alternative courses of action, comparison of the costs and benefits is the central focus of the EA process. To the extent that the relevant costs and benefits can be accurately measured or reliably estimated, the comparison of alternatives can be greatly facilitated by computer assistance. At this stage on an EA, the quantifiable benefits of the alternatives are equivalent, thus, further facilitating comparison. In such cases, the EA computations lead to aggregated cost measures which are readily comparable; other things being equal, the least cost alternative is optimal.

In comparing alternatives, it is important to consider nonquantifiable benefits and costs as well as the quantifiable ones which enter into the calculations. This is especially true in situations in which the quantitative results of two or more alternatives are equal (or almost equal). That is, the smaller the quantitative variation among alternatives, the greater the importance of other considerations.

The process of comparing alternatives also presents an opportunity to reevaluate the reliability of the cost and benefit estimates incorporated in the analysis. This is particularly advisable when both aggregated costs and aggregated benefits of two or more alternatives are approximately the same.

1.3.2.6 Performance of Sensitivity Analysis. When the results of the above step do not reveal a clearly superior alternative, it is useful to include one or more sensitivity analyses as part of the EA. A sensitivity analysis allows the analyst to engage in a "what if" process to determine how critical the particular assumptions used in the EA are to the EA results. In the sensitivity analysis, selected parameters or assumptions are allowed to vary by a specified percentage to determine whether or not an error in estimation of costs is likely to lead to an inappropriate ranking of alternatives.

Since the purpose of the sensitivity analysis is to test how sensitive the results are to variation in costs, it is especially important to subject expense items, which are relatively large and uncertain to sensitivity analysis. If small variations in expense items cause a change in alternative ranking, the analyst may be well-advised to reevaluate estimates and refine them in order to reduce the degree of uncertainty.

By including the results of the sensitivity analysis in the final EA presentation, the analyst assures the decision-maker and reviewer that uncertainties have been considered.

1.3.2.7 Report of Results and Recommendations. The EA report should be comprehensive and should include data sources. To the extent possible, it should serve as a "stand-alone" document for the decision-maker to use in deciding on appropriate use of resources. From the perspective of the analyst, the ranking of alternatives by comparison of costs and benefits (step five of the EA process) and the sensitivity analyses (step six) are likely to appear straightforward and self-explanatory. The decision-maker, however, needs additional information.

The structure of the report should begin with a summary of the analysis, including recommendations based on the content of the EA. The actual decision may be based on non-economic as well as economic considerations. The EA recommendations should not automatically be interpreted as the "right answer" for decision-making purposes, but rather as an important input into the final decision-making process. The analyst should therefore limit recommendations, based on ECONPACK, to the economic aspects of the problem.

Following the summary and recommendations, the EA report should provide a step-by-step explanation of the basis for the recommendations. This explanation should ideally follow the structure of the EA process itself. That is, it should include: statement of objective (requirement to be met); definition of alternatives; explanation of assumptions; cost and benefit data and sources; comparative ranking of alternatives based on costs and benefits; and sensitivity analysis result.

1.3.3 Summary of Governing Regulations. The Department of Army has two regulations governing the use of economic analysis. AR 11-28, Economic Analysis and Program-Evaluation for Resource Management, provides guidelines for conducting an economic analysis of Army projects. AR 414-15, Military Construction, Army Program Development, applies these general rules to military construction projects. Both regulations are summarized below. To obtain a copy of regulation AR 11-28, contact HQDA (DACA-CAF), Washington, DC, 20310. To obtain a copy of AR 415-15, contact: HQDA (DAEN-ZCP-M), Washington, DC, 20314.

#### Summary of AR 11-28

Purpose: Economic considerations are essential in determining how to allocate limited resources. An economic analysis is a method for assuring that mission managers establish the objectives of a proposed project, research alternative means

for meeting the objectives, and determine the cost and benefits of each alternative. An economic analysis summary should "answer concisely the fundamental question the mission manager is faced with--will the results (benefits) be worth the costs if the action is approved?."

ECONPACK does not constitute a complete economic analysis because it does not attempt to account for the benefits of a project. ECONPACK does, however, provide information which is essential to the overall cost/benefit analysis.

**Applicability:** All proposed construction projects submitted to headquarters for approval must be accompanied by an economic analysis or a statement justifying why an economic analysis was not performed. In general, an economic analysis is required whenever a project requires funding for the first time or would require an adjustment to a previously established budget. An economic analysis is not required if the following apply:

1. "The benefits of the analysis are not worth the minimum level of effort to do the analysis...The degree and depth of the analysis, should be commensurate with the complexity of the action proposed...In some cases, the analysis may involve only an hour's research, but it provides the basis for a more informed and considered decision."
2. "DoD instruction/directives prescribe equipment age or condition replacement criteria, labor and equipment trade-off standards, or requirements computations."
3. "The proposed actions are mandated by statute, regulation or a directive of higher authority which preclude any choice or trade-off among alternatives...This exception does not apply if the proposal is the result of a congressionally approved Army request, rather than an action initiated by Congress."

**Responsibility:** The economic analysis should be performed at the same organizational level that originated the request for resources. The responsibility for assuring that the analysis is performed rests with the mission manager. Each command level must also evaluate the completeness and accuracy of the economic analyses it submits.

**Ingredients of an Analysis:** Each analysis must contain these minimum elements:

- The objective of the proposed action.
- Specification of assumptions and constraints underlying the analysis.
- Identification of alternatives.

- Listing of the benefits of the alternatives.
- Cost estimates for each feasible alternative.
- The relationship of benefits to costs for each alternative.

When appropriate, the analysis must also include an assessment of the uncertainty of the cost predictions.

Note: ECONPACK has been designed to satisfy all of the applicable requirements listed above.

#### SUMMARY OF 415-15

Purpose: This regulation applies the general principles set out in AR 11-28 (see pages 1-7 through 1-9) to military construction programs.

Applicability: This regulation applies to the Active Army. The Army National Guard and the US Army Reserve are also covered when they are tenants on Active Army installations.

Requirements: AR 415-15 requires a detailed project justification for most military construction proposals. This detailed justification is contained in Block 11 of DD Form 1391, which consists of 18 justification paragraphs. This summary will explain two paragraphs dealing with economic analysis, and a third section concerning special requirements paragraphs.

AR 415-15, 8-5, Consideration of Alternatives: This section covers paragraph four of the justification form, which requires analysts to evaluate all alternatives to a proposed project. Examples of possible alternatives include similar on-post facilities, available off-post facilities, and nearby military facilities. A summary of the analysis of the alternatives must be given. Key economic data should be included under paragraph 11 of the justification.

AR 415-15, 8-12, Economic Justification: All military construction projects justified on an economic basis must include an economic analysis, which is to be summarized in paragraph 11 of the justification. The summary should include all key economic data and an explanation of the economic analysis, SRP-1. SRP-1 will include the actual economic analysis. If an analysis were not performed, the justification for waiving it should be stated here.

AR 415-15, 9-2, Special Requirements Paragraphs (SRP): The Special requirements paragraphs of DD Form 1391 provide for the inclusion of extended analytical and statistical material and other special documents.

1.3.4 Types of Economic Analysis. Army guidance categorizes EAs into two separate types: primary economic analysis and secondary economic analysis. The structure of the economic analysis process is similar whether the EA being produced is primary or secondary. However, budgetary effects, report formats, and certain computations, differ somewhat depending on analysis type.

1.3.4.1 Primary Economic Analysis. A primary EA is designed to determine whether an existing situation or procedure should be changed in some way to take advantage of dollar savings available through some other situation or procedure. In a primary EA, then, direct comparison is made between new alternatives (new ways of meeting an existing requirement) and the status quo alternative (the way the requirements is currently being met). If two or more new alternatives are being considered, each is compared directly to the status quo alternative.

In this framework, the objective or requirement is already being met. The question is whether it could be met more efficiently (i.e., at less cost) in a different manner. The focus, then, is on the net savings which may be possible by substituting a new approach to meeting the requirement in place of the status quo approach.

As an example of a situation in which a primary EA would be appropriate, consider an installation which currently purchases certain maintenance services from a local company. Continuation of this practice would represent the status quo alternative. If the same maintenance services could be obtained by employment of additional personnel at the installation, this would represent a new alternative. A primary EA would not be concerned with justification of the need for the maintenance services, but it would address the question of whether or not the services could be obtained at less cost (i.e., with a positive net savings) if the new alternative (additional personnel) were instituted in place of the status quo alternative (purchase from a local company). If the new alternative turns out to be less costly and is adopted, the effect is to reduce budgetary outlays.

1.3.4.2 Secondary Economic Analysis. A secondary economic analysis is designed to determine which of two or more alternative courses of action would most economically fulfill an objective or requirement which is not currently being met. Since the objective is not already being satisfied, in this case, there is no status quo alternative; all alternatives begin on an equal footing and each must be compared against each of the others. In the absence of a status quo alternative as a fixed standard of reference, the focus of this type of analysis is on net benefits (benefits minus costs) rather than on net savings. In the common use of equivalent benefits for each of the alternatives under

use of equivalent benefits for each of the alternatives under consideration (i.e. benefits or effects sufficient to meet the need specified in the objective), the problem becomes one of cost minimization. Overall costs are calculated for each of the alternatives and then ranked; other things being equal, the least-cost alternative is preferred.

While this analysis type does not directly calculate net savings from a status quo situation, the savings resulting from one alternative (e.g., "3") can easily be calculated as the overall cost difference between the two alternatives (e.g., overall cost of alternative A minus overall cost of alternative B). Thus, the secondary analysis framework also allows the issue of savings to be addressed, though in a less direct fashion. Interpretation of these savings, however, requires further consideration. In the context of meeting a new requirement, an increase in budgetary outlay will be required; the saving represents a relative rather than an absolute saving. That is, while budgetary outlay will increase (thus no absolute saving), the increase in outlay with the most economical alternative will be smaller than would occur if a different alternative were to be chosen (thus a relative saving).

It should also be noted that in situations where a primary analysis can be conducted (i.e., where a status quo alternative does exist), the analyst may choose to conduct a secondary analysis. In this case, the status quo alternative is simply specified as one of the several alternatives to be considered equally with the other alternatives. This allows for direct comparison of all alternatives (including the status quo) and ranking by overall cost levels.

1.3.5 Report Formats. ECONPACK report options include required formats for automated inclusion in the DD Form 1391 as prepared via the DD1391 Processor. These standardized report formats summarize the essential data included in an EA, and therefore constitute a substantial component of a comprehensive EA submission. In running the ECONPACK program, user specification of analysis type (primary or secondary) automatically dictates which of the two required formats (A-1 or A) will be included; therefore no separate format specification is required. An optional format (B) can be used along with the required formats for both primary and secondary analyses. Formats A-1, A, and B are shown in Appendix C.

1.3.5.1 Format A-1. Format A-1 is required for a primary analysis. This format summarizes the calculation steps used to determine the net present value of the cost for the proposed change (i.e., new alternative) and the net present value of the savings estimated to result from the proposed change.



Format A-1 also includes the savings to investment ratio (SIR) and the discounted paybacks period (DPP) for the new alternative. Both of these measures are indicators of the attractiveness of implementing the proposed new alternative in place of the status quo alternative. The SIR is net savings divided by net investment (both in terms of present value). The DPP is the number of years from the time the project (alternative) is initiated to the time when the present value of investment costs is equal to the present value of savings. The larger the SIR (i.e., the greater savings are relative to the investment required to achieve them) and the smaller the DPP (i.e., the shorter the period required for savings to offset the investment costs which generate them), the more attractive is the alternative.

1.3.5.2 Format A. Format A is required for secondary analysis. This format summarizes the calculation steps leading to the net present value of the project costs for a given alternative. There is one Format A for every alternative included in a secondary analysis. Using Format A, the analyst and the decision-maker can directly compare the costs (in present value terms) of all alternatives under consideration.

1.3.5.3 Format B. Format B, "Summary of Project Benefits," is optional. It provides an explanation of any benefits which may result from an alternative under consideration.

In the case of primary analysis, the savings resulting from a proposed change can be thought of as benefits. For secondary analysis, most EAs involve determining which alternative requires the least cost to reach a given objective or benefit level. Format B can be used for a discussion of project effectiveness. Some project alternatives may have significant nonquantitative advantages or shortcomings which can be indicated by use of Format B.

#### 1.3.6 Non-Housing vs. Housing Analysis

1.3.6.1 Non-Housing Analysis. In a non-housing analysis, the following assumptions are made automatically:

- A. A ten percent (10%) discount rate.
- B. Continuous discounting.
- C. No inflation.
- D. No residual schedules.

1.3.6.2 Housing Analysis. Greater user flexibility is allowed in the performance of EAs using ECONPACK if a housing analysis is specified.

ECONPACK is structured to allow a discount rate of other than 10 percent to be used. Given a fixed expense stream for future years, use of a higher discount rate will result in a lower present value of costs whereas, use of a lower discount rate will result in a higher present value of costs. It should be noted, however, that current DoD policy for EAs requires that a 10 percent discount rate be used.

Continuous discounting assumes that costs for a given year are spread evenly throughout the course of the year. In some cases, however, the costs may occur at a particular point in time (e.g., at the end of the year). In this situation, use of the end-of-year discounting convention will provide a truer measure of the present value of the costs. In a housing analysis, the user can specify use of a discounting convention other than that of continuous discounting.

In general, DoD policy requires that EAs be done in constant (i.e., uninflated) dollars. Although the general inflation rate is not applied to constant dollar cost estimates for future years, ECONPACK allows for the use of differential inflation in the performance of EAs. Differential inflation is the difference between the rate of inflation for a particular expense item and the general inflation rate for the economy as a whole.

Specification of an EA as a housing analysis enables the user to make use of residual schedules, an option not available in a non-housing analysis. Residual schedules make it possible to determine residual (or salvage) values for assets at any point during the period of analysis. The analyst is thus given increased flexibility in treatment of asset valuation.

If the extra features available in a housing analysis are needed in an EA which is not actually concerned with a housing problem, the analysis should be classified as "housing" in the operation of ECONPACK.

1.4 ECONPACK User Modes. The User can prepare an ECONPACK input file in either of two ways. The input file can be entered by means of a terminal prompting mode or by means of a file input mode utilizing the computer system editor program.

1.4.1 Terminal Prompting Mode. Use of this mode requires little knowledge of the computer system and relatively limited expertise in economic analysis. It is, therefore, especially appropriate for an occasional user or a beginner. Since the structures employed in the two input modes are similar, it is useful when

beginning to produce EAs using ECONPACK to become familiar with the terminal prompting mode even if the user expects ultimately to use the file input mode.

The terminal prompting mode is interactive. Entering data or creating an input file is accomplished by responding to a series of prompts. This prompting sequence leads the user step-by-step until the input file is created and the program is ready for execution.

Chapter 5 of this manual discusses the terminal prompting mode.

1.4.2 File Input Mode. The file input mode is a less rigidly structured means of creating and editing input files on ECONPACK. This less rigid structure has a significant advantage in that it allows greater user flexibility than is possible with the terminal prompting mode. Also, it allows for certain options not available with terminal prompting. On the other hand, the file input mode has the disadvantage of requiring substantially greater knowledge of the computer system and of the economic analysis process since the user is not explicitly directed through the input procedure.

Chapter 7 of this manual discusses the file input mode.

CHAPTER 2  
SELECTED ECONOMIC CONCEPTS USED IN ECONOMIC ANALYSIS

2 ECONOMIC CONCEPTS IN ECONOMIC ANALYSIS

2.1 Introduction. The purpose of this chapter is to provide background information about a few economic concepts which need to be understood by creators of military construction EAs. Further, the terminology introduced should be helpful to novice users of the ECONPACK software package. This chapter is not designed to define "all" of the concepts employed in EAs. Appendix A of this manual is a glossary which can be referred to for definition of concepts unfamiliar to the user.

2.2 Discounting. Most military construction EAs are essentially cost minimization problems - i.e., analysis of how a given objective can be fulfilled at least cost. The dollar costs are not, however, completely comparable because they occur at different points in time. The discounting process serves to adjust dollar amounts so that costs incurred at different points in time can be directly and meaningfully compared. This adjustment reflects the fact that the significance attached to a particular dollar amount to be paid (or received) at a later date is less than the significance attached to the same dollar amount to be paid (or received) now.

The discounting process can most easily be understood by first examining its opposite, the compounding process. Assume that a renewable loan of \$1,000 is made at an annual interest rate of 10 percent. The \$1,000 used to make the loan is money held now; therefore it represents a present value (PV). If the loan is repaid after one year, the repayment amount is \$1,100, of which \$1,000 is principal and \$100 is interest. This \$1,100 to be received one year from now represents a future value (FV). Letting the subscript indicate the number of years until repayment, and "i" represent the interest rate, this relationship can be expressed as:

$$FV = PV(1+i).$$

Substituting our assumed values for PV and i yields:

$$FV = \$1,000(1+0.1) = \$1,000 (1.1) = \$1,100.$$

If, instead of receiving repayment at the end of one year, the loan is renewed for a second year, its future value at the end of two years is \$1,210. The interest received for the second year of the loan is \$110, or \$10 more than the interest accrued during the first year. This represents interest accrued on both the \$1,000 principal amount and on the \$100 interest accrued

in the first year. The calculation is as follows:

$$FV_2 = FV_1 (1+i) = \$1,100 (1+0.1) = \$1,210.$$

Since  $FV_1$  is  $PV (1+i)$ , substitution reveals that:

$$FV_2 = PV (1+i)(1+i) = \$1,000(1+0.1)^2 = \$1,000 \times (1.1)^2 = \$1,000 \times 1.21 = \$1,210.$$

Extending and generalizing this pattern leads to the following expression as the formula for calculation of future value for  $n$  years:

$$FV_n = PV (1+i)^n.$$

Discounting, is the opposite of compounding. Whereas compounding is the process of converting present to future values, discounting is the process of converting future values to present values. The present value of a given future amount to be received at a specific future date (i.e., after a specific period of time) is equal to the present amount that would accumulate to that future amount by that date given a particular interest rate. For example, the present value of \$1,210 to be received two years from now is \$1,000 if the appropriate interest rate is 10 percent. The formula for calculation of present value (for the end-of-year convention) can easily be derived from the formula for future value calculation. Since

$$FV_n = PV (1+i)^n,$$

it follows that

$$PV = (FV_n) / (1+i)^n$$

The interest rate ( $i$ ) in this formulation is known as the discount rate. Current DoD policy requires a 10 percent discount rate for EAs.

2.3 Inflation and Differential Inflation. The term "inflation" refers to a general rise in price levels in an economy. If the expected inflation rate is judged to affect all costs of an EA equally, no special treatment is necessary. However, if certain types of costs are expected to suffer from a higher level of inflation than the general economy, ECONPACK has the capability to handle this situation with the differential inflation feature. Specifically, the user can apply a differential inflation factor to any expense item in the EA. Since the concept is "differential" inflation, the user would use a factor representing the difference between the expected general level of inflation and the expected level of inflation for a particular expense item.

For example, if the expected general level of inflation is 10 percent and the expected level of inflation for a particular expense item is 15 percent, the differential inflation factor would be 5 percent.

2.4 Determination of Asset Value Over Time. Most assets do not retain their full value over time. In private sector application, this phenomenon is dealt with through the depreciation process. Depreciation, as used in the private sector, is oriented primarily toward tax effects rather than toward actual erosion of asset value over time. Since the government pays no taxes, depreciation per se is irrelevant and should not be included in EAs of government investments. Realistic valuation of government assets, however, does require that account be taken of this reduction in asset value. ECONPACK allows for such asset value adjustment in two ways: utilizing a residual schedule or stating a salvage value.

2.4.1 Residual Schedule Method. At this point, it is useful to define four key concepts:

- 1) Residual Start Value: The asset's original value.
- 2) Residual Factor: The proportion of the original asset value retained in a given year.
- 3) Residual Value: The dollar amount of asset value retained in a given year (i.e., the residual start value multiplied by the residual factor for a given year).
- 4) Residual Schedule: A list of residual factors.

The user may choose from among three "sub-options" if electing to employ the residual schedule concept instead of the salvage value concept: the straight line depreciation schedule (SL), the amortization declining balance schedule (DB), or a user specified schedule (US). The last schedule would be prepared based on the user's judgment of asset value erosion for the particular type of asset.

2.4.2 Salvage Value. A second way to recognize depreciation is by stating a user specified salvage value (also referred to as "terminal value"). Normally, a salvage value is a nominal sum at which an asset is valued at the end of its functional life.

## CHAPTER 3 TECHNICAL INFORMATION

### 3 TECHNICAL INFORMATION

3.1 Introduction. The purpose of this chapter is to explain some of the capabilities of ECONPACK, provide more detailed interpretations of selected EA terms, and explain key procedures for using ECONPACK.

3.2 File Space. Each user is allotted a fixed amount of disk storage space. The report file from several analyses will consume much of this space. Also, a certain amount of disk space is temporarily required during program execution. One analysis may require 600 blocks of free disk space. The user may ascertain available disk space in two ways:

1. This information will be made available almost immediately after choosing the ECONPACK option from the PAX Menu.
2. Enter the CMS mode by choosing Option 7 from the ECONPACK MAIN MENU. At the C>, type QUERY DISK A (CR). This will display the percentage of disk space available for the label under which the user logged in.

To leave CMS and return to ECONPACK, type ECONPACK (CR) at the C>. To return to the PAX Menu, type LOG (CR) at the C>.

If additional disk space is needed, call Jean Sherwood at AV 285-0578, FTS 272-0578, or COMM (202) 272-0578 and request additional cylinders be added.

3.3 Negative Inputs. The user may be required to use negative inputs on at least two occasions:

1. Normally an expense item is a cost. However, if the user desires to show an influx of funds for a particular alternative, the minus (-) sign may be used to indicate an expense item as a negative input. Negative expense items should be avoided in performing a sensitivity analysis.
2. The terminal prompting routine will ask if each alternative has a salvage value (also known as a terminal value). Usually a salvage value is a positive number, indicating a nominal value at which an asset is valued. However, if an expenditure of funds would be

required to remove an alternative, the user may reflect this fact by stating the salvage value in negative terms. (For example, demolition costs are expressed as negative numbers.)

3.4 Entering Maintenance and Repair Costs. Normally, certain costs must be incurred on a periodic basis to keep a facility usable (maintenance costs) or to refurbish a facility (repair costs). It is important to correctly state the timing of the costs for a consistent and correct EA.

To illustrate, assume an alternative calls for constructing a facility with a 25 year economic life. Further, assume that it will take 3 years to construct the building. Thus, the period of analysis is 28 years.

Assuming maintenance costs of \$50,000 a year are expected, the correct data entry would be three years of no cost followed by 25 years of \$50,000/year, expressed as  $3*0\ 25*50000$ , since no maintenance costs would be incurred during the three-year construction phase.

Assuming the analyst predicts that a new roof costing \$50,000 will be needed in year 10, the correct data entry for the repair cost would be  $12*0\ 50000\ 15*0$  showing no costs during the first 12 years of the period of analysis, a \$50,000 cost in the 13th year, and 15 more years of zero repair costs.

3.5 Warnings. If using the terminal prompting mode, do not use single quotes in any input as it will cause major errors in the analysis routine.

All cost data should be entered in actual dollars and not in thousands or millions of dollars. Do not use commas or dollar signs. Use whole numbers.

If the user supplies an input filename which is the same as an input filename which already exists, then the input file created will erase the existing file and replace it with the new file.

3.6 Limits on Files Created. The following limits apply to files created with the terminal prompting mode:

Maximum Number of Alternatives	20
Maximum Number of Expense Items (Costs) per Alternative	20
Maximum Number of Inflation Tables	10
Maximum Number of Residual Schedules	10



Maximum Number of Alternatives to be Graphed	6
Maximum Number of Sensitivity Analyses for one EA Run	30

3.7 Procedures For Using ECONPACK. The procedures presented in this section provide instructions for using ECONPACK. The specific procedures explained are:

1. Logging on to the Economic Analysis Computer Program (ECONPACK)
2. Selecting the IBM or QED Edit Choice/Mode
3. Verifying An Edit Choice
4. Changing An Edit Choice
5. Logging off ECONPACK and the PAX System

NOTES:

1. In all procedure sections, data to be entered by the user is underlined. Parentheses ( ) indicate keys on the keyboard to be used during the computer/user interaction. (Ex. - (CR) means the user should type the carriage return key once.) Additional notes are enclosed in brackets.
2. Once the user has initiated the prompting routine to create an input file, the command /QUIT may be entered at any prompt to terminate the routine. The system will prompt the user to indicate whether or not the partially constructed input file is to be saved on the user's System Disk.
3. ESCAPE KEY. Once execution of the analysis program begins, the user should not stop the execution unless something is obviously wrong.

If a need to stop the analysis arises, depress the ESCAPE key once. The system should respond with a ??> prompt. At the ??> prompt, enter HX and depress (CR). This halts execution. The user will then receive another prompt at which an option from the MAIN ECONPACK MENU should be entered.

4. /HELP. The user can enter /HELP at any prompt, in the terminal prompting mode, for a message from ECONPACK as to the appropriate response for a prompt.

5. ASSISTANCE IN LOGGING ON, COMMUNICATIONS, or EQUIPMENT INTERFACE. TYMSHARE'S 24-hour HOTLINE (COMM-703-893-4243) or FTS (202-893-4243) is available whenever a user needs assistance with logging on, communications, or equipment interface.

### 3.7.1 Logging on to the Economic Analysis Computer Program (ECONPACK)

#### STEP 1: ESTABLISH TELEPHONE COMMUNICATION WITH THE COMPUTER.

The user must first establish telephone communication with the computer. This step is accomplished in various ways dependent upon the type of equipment being used as well as how that equipment has been set up. Some users may simply have to turn the equipment on, hit a specified key on the keyboard, and the communications line will automatically be accessed. Others may have to dial the assigned telephone number, listen for a high-pitched sound, and then insert the telephone receiver in the terminal's coupler or release a specified button on the equipment's modem. Once the appropriate steps have been followed to establish telephone communication with the computer, the system will quickly prompt the user to enter a "terminal identifier". To prompt the user, the system will either display a string of garbage-like characters or actually print the words "PLEASE TYPE YOUR TERMINAL IDENTIFIER". The user should respond by entering the terminal identifier. A terminal identifier indicates to the computer the type of equipment required to communicate with the user's terminal. If the wrong identifier is entered, telephone communication will probably be terminated. [See Appendix B for a list of appropriate terminal identifiers for various equipment.]

#### EXAMPLE:

Establish communications line.

PLEASE TYPE YOUR TERMINAL IDENTIFIER A  
-3122-007-

#### STEP 2: "LOG ON" TO THE COMPUTER AND THE PAX SYSTEM.

Once the terminal identifier has been entered, the system will prompt for the System User ID and System Password assigned the user's activity. These two words identify the user, the programs that user may access, and the activity to be billed for the session. [If the correct System ID and Password are not entered within 2 1/2 minutes after the user establishes telephone

communication, the computer will automatically disconnect.) The system then prompts for a "project code." The user should enter his/her initials. The system then responds by printing the date and time the user logged on to the computer.

Once logged on to the computer, the user has immediate access to the PAX System. The system indicates the PAXMAIL status for the user's System ID. [PAXMAIL is a feature of the PAX System which allows PAX users to communicate with each other.] The system then responds with "LOG ON" messages which provide a variety of urgent information. Following the LOG ON message is a display of the PAX SYSTEM MENU, in which the system lists the components of the PAX System available to the user. The number of components available to each System ID will vary. The system then prompts the user to make a selection.

EXAMPLE:

PLEASE LOG IN: [ENTER YOUR ASSIGNED SYSTEM USER ID.]  
(CR)

PASSWORD: [ENTER YOUR SYSTEM PASSWORD] (CR)  
PROJECT CODE: [ENTER YOUR INITIALS] (CR)

V34M 01/14/86 14:15

\*\*\*\*\*  
PAXMAIL STATUS: MAIL WAITING  
\*\*\*\*\*

SEE NEWSLETTER NO. 27 FOR GREEN RIBBON PANEL/ENGINEER  
INSPECTOR GENERAL REPORT UPDATE

PLEASE HIT A CARRIAGE RETURN TO CONTINUE.  
>(CR)

STEP 3: "LOG ON" TO ECONPACK.

To access ECONPACK, the user must enter the number from the PAX System Menu which identifies ECONPACK. The system responds by indicating PROJECT PAX, the amount of clock time and computer time used in the PAX System, the percentage of storage space available on the user's ECONPACK permanent disk, and then welcomes the user to ECONPACK.

EXAMPLE:

PAX SYSTEM MENU

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

PAX>1 (CR)

PROJECT PAX

CONNECT= 00:00:15 TRU= 2.77 T10= 350

89% OF DISK SPACE AVAILABLE

\*\*\*\*\*

IBM

\*\*\*WELCOME TO ECONPACK\*\*\*

\*\*\*\*\* N O T I C E \*\*\*\*\*

TEACUP has been removed from the active system. TEACUP input files may not be used with the new ECONPACK Program. SUGGEST that you remove all TEACUP files from your ECONPACK directory.

See HELP FACILITY Option 2 (How to use ECONPACK under PAX) for information on moving ECONPACK output files to a DD Form 1391.

Users may use a /QUIT command at any prompt during the input sequence to exit the input process. You will then be prompted as to whether you want to keep the input session data or not.

Users may use a /HELP command at any prompt during the input sequence. This command will provide you with information concerning commands available at this point.

PLEASE HIT A CARRIAGE RETURN TO CONTINUE  
>(CR)

\*\*\* MAIN ECONPACK MENU\*\*\*

1. CREATE AN INPUT FILE
2. ADD TO OR CHANGE AN EXISTING INPUT FILE
3. EXECUTE ECONPACK
4. PRINT ECONOMIC ANALYSIS REPORTS
5. CHECK MANUAL INPUT FILE FOR ERRORS
6. HELP FACILITY
7. CMS
8. RETURN TO PAX MENU

ENTER DESIRED OPTION>

### 3.7.2 Selecting The IBM or QED Edit Choice/Mode

TASK 1: LOG ON TO THE PAX SYSTEM BY FOLLOWING THE STEPS SPECIFIED IN PROCEDURE 3.7.1.

TASK 2: SELECT AN EDIT CHOICE/MODE.

If a SYSTEM USER ID is new to the system or if the EDIT CHOICE file on the permanent disk has been erased, the system prompts the user to select an edit choice or edit mode. The user receives the following message.

THIS MESSAGE, WHICH WILL APPEAR ONLY ONCE, PROVIDES YOU THE OPPORTUNITY TO SELECT YOUR PREFERENCE OF EDIT MODES FOR THE ECONOMIC ANALYSIS PACKAGE SYSTEM. YOUR SELECTION WILL AUTOMATICALLY REMAIN IN EFFECT FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. YOU MAY CHANGE EDIT MODES AT A LATER TIME BY TYPING A NEW SELECTION (IBM or QED) AT THE CMS (C>) PROMPT.

EXAMPLE: C>QED

- (1) QED EDITOR = CONTROL A - FOR CHARACTER DELETION  
                  = CONTROL W - FOR WORD DELETION  
                  = CONTROL Q - FOR LINE DELETION  
                  = CONTROL R - FOR PRINTING REVISED LINE  
                                  BEFORE ENTERING A CARRIAGE  
                                  RETURN
- (2) IBM EDITOR = @ - FOR CHARACTER DELETION  
                  = [ - FOR LINE DELETION

ENTER NUMBER OF CHOICE >

If the user enters 1 and a carriage return, the system prints the following response:

THE QED EDIT MODE WILL AUTOMATICALLY BE USED FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. THIS SELECTION MAY BE CHANGED TO THE IBM EDIT MODE AT ANY TIME BY TYPING "IBM" AT THE C PROMPT.

If the user enters 2 and a carriage return, the system prints this response:

THE IBM EDIT MODE WILL AUTOMATICALLY BE USED FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. THIS SELECTION MAY BE CHANGED TO THE QED EDIT MODE AT ANY TIME BY TYPING "QED" AT THE C PROMPT.

Decide whether you wish to use the IBM edit mode or the QED edit mode. Make your choice and enter either the number 1 (CR) or the number 2 (CR) at the ENTER NUMBER CHOICE prompt. The system then welcomes the user to the ECONPACK Program and displays the MAIN ECONPACK MENU.

#### 3.7.2.1 Verifying An Edit Choice

TASK 1: USE PROCEDURE 3.7.1 AND LOG ON TO THE PAX SYSTEM.

TASK 2: VERIFY AN EDIT CHOICE.

An edit choice or mode may be checked or verified at the CMS (C) prompt. CMS may be accessed from the MAIN ECONPACK MENU by selecting Option 7. The IBM or QED edit mode is controlled on the system by a Permanent Disk file with the filename filetype EDIT CHOICE. The CMS command TYPE may be used to verify the file content.

EXAMPLE:

C> TYPE EDIT CHOICE (CR)

If the user's edit mode is IBM, the system responds:

IBM

If the user's edit mode is QED, the system responds:

QED

The system then returns the user to a C prompt.

#### 3.7.2.2 Changing An Edit Choice/Mode

TASK 1: USE PROCEDURE 3.7.1 AND LOG ON TO THE PAX SYSTEM.

TASK 2: CHANGE YOUR EDIT MODE.

An edit mode may be changed at the CMS (C>) Prompt. CMS may be accessed from the MAIN ECONPACK MENU by selecting Option 7. To change from the IBM edit mode to QED, simply type QED at the C prompt. To change from the QED edit mode to IBM, simply type IBM at the C prompt.

If a user is using QED and types IBM at the C prompt, the system responds as follows:

C> IBM (CR)

THE IBM EDIT MODE WILL AUTOMATICALLY BE USED FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. THIS SELECTION MAY BE CHANGED TO THE QED EDIT MODE AT ANY TIME BY TYPING "QED" AT THE CMS (C>) PROMPT.

THE FOLLOWING COMMANDS ARE APPLICABLE IN THIS MODE:

1. @ = DELETES A CHARACTER.
2. [ = DELETES THE ENTIRE LINE.

The user is then returned to the C prompt.

If a user is using IBM, and types QED at the C prompt, the system responds as follows:

C> QED(CR)

THE QED EDIT MODE WILL AUTOMATICALLY BE USED FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. THIS SELECTION MAY BE CHANGED TO THE IBM EDIT MODE AT ANY TIME BY TYPING "IBM" AT THE CMS (C>) PROMPT.

THE FOLLOWING COMMANDS ARE APPLICABLE IN THIS MODE:

1. CONTROL A = FOR CHARACTER DELETION
2. CONTROL W = FOR WORD DELETION
3. CONTROL Q = FOR LINE DELETION
4. CONTROL R = FOR PRINTING REVISED LINE BEFORE ENTERING A CARRIAGE RETURN

The user is then returned to the C prompt.



### 3.7.3 Logging Off ECONPACK and the PAX SYSTEM

From the ECONPACK menu, the user selects Option 8 to return to the PAX System Menu. If the user is at a C prompt, the command LOG will cause the system to return to the PAX System Menu. At the PAX prompt, the user should enter the command LOG to exit the system. When the prompt PLEASE LOG IN: appears on the screen, the user should terminate the communications connection.

EXAMPLE:

\*\*\*\* MAIN ECONPACK MENU\*\*\*\*

1. CREATE AN INPUT FILE
2. ADD TO OR CHANGE AN EXISTING INPUT FILE
3. EXECUTE ECONPACK
4. PRINT ECONOMIC ANALYSIS REPORTS
5. CHECK MANUAL INPUT FILE FOR ERRORS
6. HELP FACILITY
7. CMS
8. RETURN TO PAX MENU

ENTER DESIRED OPTIONS>8 (CR)

\*\*\* LEAVING ECONPACK \*\*\*

PROJECT ECON

CONNECT= 00:25:05 TRU= 29.45 TIO= 16,352

PAX SYSTEM MENU

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

PAX>LOG (CR)

PROJECT PAX

CONNECT= 00:01:39 TRU= 2.44 TIO= 362

LOGOFF AT 15:11:36 CST TUESDAY 01/14/86

PLEASE LOG IN: [Terminate communications connection.]

3.8 Text Editor Commands. Users may wish to use the CMS option from the MAIN ECONPACK MENU to create files or modify input files stored on the ECONPACK PERMANENT DISK. When doing so, use must be made of text editing capabilities. A quick reference guide for text editor commands is provided on the following pages. Detailed procedures for entering text can be found in the DD Form 1391 Processor Users Manual.

## QUICK REFERENCE GUIDE

### TEXT EDITOR COMMANDS

Note: [ ] indicates optional parameters.  
/ indicates a delimiter that sets off a string of characters.  
\* indicates the current line and all lines below will be affected by the command.  
\_ indicates the shortened version of a text editor command.

COMMAND	FUNCTION
1. <u>B</u> OTTOM	Position the line pointer at the last line of text.
2. <u>C</u> HANGE/old string/new string/[lines[*]] *	Changes a character string in one or more lines
3. <u>D</u> ELETE [lines] *	Begins with the current line and deletes the specified number of lines.
4. <u>F</u> ILE	Returns the system to the form editor environment and adds the temporary file to the working copy of the form.
5. <u>G</u> ETFILE filename filetype	Inserts the contents of the specified file into the working file beginning at the current line.
6. <u>G</u> OTO linenumber	Moves the line pointer to the line specified by its line number.
7. <u>I</u> NPUT [new line]	Causes the system to enter the "input mode" so one or more lines can be entered after the current line. The line pointer is positioned at the last line entered.
8. <u>L</u> OCATE [/string/]	Searches down the temporary file for the specified string and moves the line pointer to the line containing the first occurrence of that string.

COMMAND	FUNCTION
9. <u>PUTFILE</u> filename filetype A [lines] *	Copies a range of lines to the specified permanent disk file. The lines copied will start with the current line. If the specified permanent disk file already exists, the lines will be added to the end of that file.
10. <u>QUIT</u>	Returns the system to the form editor environment without entering the temporary file on the working copy of the form.
11. <u>REPLACE</u> [new line]	Deletes the current line and replaces it with the specified new line(s). The line pointer is positioned at the last line entered.
12. <u>TABSET</u> position list	Allows the user to specify tabulation stops.
13. <u>TCP</u>	Moves the line pointer to TOF:, the imaginary line above the first line of text.
14. <u>TYPE</u> [lines] *	Beginning with the current line, the system prints the specified number of lines and moves the line pointer to the last line printed. If no number is specified, only the current line is printed.
15. <u>UP</u> [lines] *	Moves the line pointer up the specified number of lines from the current line (if a number is specified) or searches up for the specified string of characters and moves the line pointer to the line containing the first occurrence of that string (if a string of characters is specified).

COMMAND	FUNCTION
16. <u>WHERE</u>	Prints the current line number.
17. <u>ZONE</u> [position1 position2]	Establishes a portion of the data line to be scanned/updated by LOCATE, CHANGE, and UP commands. The two position numbers specify the first and last column positions. Omitting the optional parameters displays the current zone settings.

[NOTE: See the DD FORM 1391 PROCESSOR USERS MANUAL for procedures on entering text. These commands can be used to edit files on the User's ECONPACK permanent disk, the DD Form 1391 Processor permanent disk, and in Special Requirements Paragraph 1.]

## CHAPTER 4 MAIN ECONPACK MENU OPTIONS

### 4 ECONPACK MENU OPTIONS

4.1 Introduction. To use ECONPACK, user must first select the ECONPACK option from the PAX menu as shown below: [Section 3.7 provides detailed instructions.]

#### PAX SYSTEM MENU

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

For this example, choose Option 1, at which time the following menu will appear.

#### \*\*\* MAIN ECONPACK MENU \*\*\*

1. CREATE AN INPUT FILE
2. ADD TO OR CHANGE /N EXISTING INPUT FILE
3. EXECUTE ECONPACK
4. PRINT ECONOMIC ANALYSIS REPORTS
5. CHECK MANUAL INPUT FILE FOR ERRORS
6. HELP FACILITY
7. CMS
8. RETURN TO PAX MENU

ENTER DESIRED OPTION>

The following presents a discussion of each menu option.

4.2 MAIN ECONPACK MENU Option 1: Create an Input File. This option allows the user to input the data file for an EA. The computer program, by a prompting routine, will ask for all the needed data. Chapter 5 discusses this aspect of ECONPACK in more detail.

The prompter uses the data input option to form "blocks" of information which are used by the main program to perform the EA. These "blocks" and their explanations are listed in the following:

# INITIAL INFORMATION BLOCK

<u>COMPONENTS</u>	<u>EXPLANATION</u>
1. Input filename	1. Use any combination of 1-8 characters and numbers. It is suggested that the project number or name be used.
2. Report title	2. This is the title which will appear at the heading of the output report. The report title can be 5 lines of 48 characters per line. If 5 lines aren't needed, type <u>(CR)</u> twice and the next prompt will appear.
3. Organization title	3. Enter the user's organization title. A maximum of 48 characters may be used.
4. Date information	4. Enter the current date of the analysis. A maximum of 48 characters may be used.
5. Project title	5. Enter the title of the project. A maximum of 48 characters may be used.
6. Objective of the analysis	6. The customer's objective is what fulfills the scope of work. A maximum of 48 characters is allowed.
7. Action officer	7. Enter the approving official at the organization and their telephone number. A maximum of 40 characters may be used.

# DATA INFORMATION BLOCK

<u>COMPONENTS</u>	<u>EXPLANATION</u>
1. Period of analysis	1. Enter the time span over which the economic analysis takes place. This period usually corresponds to the economic life of the project.
2. Start year of the analysis	2. Enter the first year of the period of analysis. The complete year (i.e. 1986) should be entered.
3. Base year of the analysis	3. Enter the first year in which initial investments are made or initial costs are incurred.
4. Whether or not a housing analysis is to be performed	4. The housing analysis option allows user to use a discount rate other than 10 percent, beginning/end year discounting, inflation factor, and residuals (depreciation schedules). These are often used in housing analyses.
5. Discount rate	5. DoD policy requires a 10 percent discount rate. If this rate is desired, enter (CR). If another rate is to be used, enter it as a percentage.
6. Differential inflation index/indices (optional)	6. An inflation index is used when a cost is expected to have a higher inflation rate than the overall economy.
7. Title of inflation index/indices (if used)	7. This is an identifying title such as DoD Index. A maximum of 20 characters may be used.
8. Values for the inflation index/indices (if used)	8. Enter the values in percentage terms. The user must enter one for each year of the period of analysis. A maximum of ten values per line is allowed. Use of asterisks can abbreviate the input. For example: 1.0 1.0 2.1 2.1 4.0 Can also be enter as 2*1.0 2*2.1 1*4.0.



DATA INFORMATION BLOCK  
(Continued)

<u>COMPONENTS</u>	<u>EXPLANATION</u>
9. Whether or not a residual schedule is desired	9. A residual schedule is a depreciation schedule for the value of the alternative over time. (See Page 5-3.)
10. Title of residual schedule(s) (if used)	10. This is an identifying title such as DoD schedule. A maximum of 20 characters may be used.
11. Values for residual schedule(s) (if used)	11. Residual values are to be entered as decimal number. (For example: .98 .96 .94 .92) A residual value must be used for each year in the period of analysis. A maximum of 10 values per line is allowed. Use of asterisks can abbreviate the input; for example, .98 .98 .96 .96 .92 can also be written as 2*.98, 2*.96, 1*.92.
12. Type of analysis (secondary or primary)	12. In a secondary analysis, several alternatives are ranked from least to highest costs. The reason for doing a secondary analysis is that there is a new requirement--such as provide maintenance facilities for 500 additional tanks. In a primary analysis, an alternative(s) is compared to an existing situation with the objective of saving money over a period of time. In a primary analysis, the status quo is the first alternative.

# ALTERNATIVES INFORMATION BLOCK

<u>COMPONENTS</u>	<u>EXPLANATION</u>
1. Names of alternatives	1. Enter an alternative name up to 20 characters long. In a primary analysis, alternative 1 is always the status quo alternative and subsequent alternatives are the proposed alternatives.
2. Titles of alternatives	2. Enter an alternative title up to 5 lines of 48 characters each. To have a blank line in the title, enter one blank and a (CR). If less than 5 lines are needed for a title, enter only a (CR) at a prompt.
3. Economic life of alternatives	3. Enter the period of time over which the benefits from an alternative are expected to accrue.
4. Titles for expense items	4. Expense items are costs for each alternative. They can be negative, reflecting an influx of funds. The title is composed of 3 lines with a maximum of 12 characters each.
5. Costs for expense items	5. Costs must be numbers such as 25000 and can contain a decimal point such as 25000.. A cost must be given for each year in the period of analysis. Use of asterisks can abbreviate the input. For example: \$25,000 cost for 3 years and \$30,000 for the next 2 years can be input as 25000 25000 25000 30000 30000 or as 3*25000 2*30000.
6. Expense item(s) to which a differential inflation factor is applied	6. Costs can be assigned an inflation factor other than no inflation. Enter the expense number.

ALTERNATIVES INFORMATION BLOCK  
(Continued)

<u>COMPONENTS</u>	<u>EXPLANATION</u>
7. Expense item(s) to which a discount factor is assigned	7. Costs can be assigned a discount factor other than midyear. Enter the expense number.
8. Decision as to whether to include a salvage (residual) value	8. A salvage or residual value is the value of the alternative at some point in time, usually at the end of the period of analysis. If it is a cost (requiring an expenditure to remove), enter it as a negative value.
9. If a salvage value is appropriate, decision as to whether a one time value (at the end of the period of analysis) or a residual schedule should be used	9. Enter <u>1</u> if the salvage value occurs at the end of the analysis period. Enter <u>2</u> if the depreciated initial value of the alternative is desired.
10. Selection of a depreciation method if user feels a depreciation schedule is in order (instead of a one-time value)	10. If the user puts in his/her own residual (salvage) value schedule, select <u>3</u> . Otherwise, choose straight line (enter <u>1</u> ) or declining balance (enter <u>2</u> ).
11. Residual start value	11. Enter the original value of the asset.
12. Residual inflation factor	12. If a residual factor is to have an inflation factor other than no inflation, enter the inflation factor desired.
13. Residual discount factor	13. If a residual is to have a discount factor other than end-of-year, select the discount factor desired by entering <u>1</u> for beginning of year or <u>2</u> for mid-year.

ALTERNATIVES INFORMATION BLOCK  
(Continued)

<u>COMPONENTS</u>	<u>EXPLANATION</u>
14. Identification of expense items (by alternative) that are recurring costs	14. Recurring costs are those that occur periodically, usually annually.
15. Identification of expense items (by alternative) that are investment costs	15. Investment costs are one time (may be over several years) costs such as construction or rehabilitation.
16. Source/derivation of recurring costs	16. Enter the source of recurring costs.
17. Source/derivation of investment costs	17. Enter the source of investment costs.
18. Source/derivation of net terminal value	18. Enter the source of the net terminal value.
19. Source/derivation of other considerations	19. Enter the source of the costs/values.
20. Benefits of dollar quantifiable benefits	20. Enter any dollar quantifiable benefits (such as decrease in labor dollars) which the alternative provides.
21. Benefits of other quantifiable benefits	21. Enter any non-dollar quantifiable benefits, such as "the new facility will permit weekly tank washing rather than monthly, resulting in less corrosion."
22. Benefits of non-quantifiable benefits	22. Enter any non-quantifiable benefits, such as safety improvement, better morale, etc.
23. Source/derivation of dollar quantifiable benefits	23. Enter the source of any dollar quantifiable benefits.

ALTERNATIVES INFORMATION BLOCK  
(Continued)

<u>COMPONENTS</u>		<u>EXPLANATION</u>	
24.	Source/derivation of other quantifiable benefits	24.	Enter the source of any other quantifiable benefits.
25.	Source/derivation of non-quantifiable benefits	25.	Enter the source of any non-quantifiable benefits.

GRAPHICS INFORMATION BLOCK

<u>COMPONENTS</u>	<u>EXPLANATION</u>
1. Alternative numbers to be graphed.	1. Place all alternative numbers to be graphed on the same line, such as 1 2 3. A maximum of 6 alternatives may be graphed.

# RANKING SENSITIVITY INFORMATION BLOCK

COMPONENTS	EXPLANATION
1. Title of sensitivity analysis	1. Normally, the title should reflect what costs are being varied. For example, the effect of increasing maintenance costs for the modified wash rack.
2. Alternative to be included in the analysis	2. Enter alternatives on one line, such as 1 2 3.
3. Alternative number whose expense items you wish to change	3. Enter an alternative previously selected to be included in the analysis.
4. Expense item(s) to change (by alternative)	4. Enter the expense item, by number, upon which a sensitivity analysis is to be performed.
5. Upper limit of the change *	5. Enter the upper limit as a percent. (CR) will default to 200 percent.
6. Alternative number to be ranked	6. Enter an alternative number previously selected to be included in the analysis to be ranked at least cost.

\* The maximum negative change is automatically set at -100 percent (reduction to zero).

4.3 MAIN ECONPACK MENU Option 2: Add to or Change an Existing Input File. Once an input file is created and saved (whether created by MAIN ECONPACK MENU Option 1, "CREATE AN INPUT FILE", or by using the file input mode), it is possible to change it. Menu Option 2 allows the user to select the block to change and then prompts for detailed changes.

Before user can use Option 2 from the MAIN ECONPACK MENU, the name of the file the user wishes to change must be known. If the user already has the name, follow these steps:

1. Select Option 2 from the MAIN ECONPACK MENU.
2. Enter filename when prompted.
3. Select the desired option from the ADD TO OR CHANGE AN EXISTING INPUT FILE menu (See below).

If the user wishes to review all existing input filenames, the following steps should be taken:

1. Select Option 7 (CMS) from the MAIN ECONPACK MENU.
2. At the C>, enter LIST (CR).
3. Review filenames. (All inputs files have a filetype of FT75F001.)
4. Enter ECON (CR) which will return user to the MAIN ECONPACK MENU.
5. Proceed as above in Step 1.

Once the filename is available, indicate which part of the input file is to be changed by selecting the appropriate option from the list below which will appear if Option 2 is selected from the MAIN ECONPACK MENU:

1. CHANGE THE INITIAL INFORMATION
2. CHANGE THE DATA INFORMATION
3. CHANGE THE ALTERNATIVE INFORMATION
4. CHANGE THE GRAPH INFORMATION
5. CHANGE THE RANKING SENSITIVITY ANALYSIS INFORMATION
6. ALL INFORMATION
7. QUIT

ENTER DESIRED OPTION

>



The illustration below displays the options of the Change Menu and provides an explanation of each option.

MAIN ECONPACK MENU OPTION 2: ADD TO OR CHANGE AN EXISTING FILE

<u>OPTION NUMBER</u>	<u>EXPLANATION</u>
1. CHANGE THE INITIAL INFORMATION	1. Allows the user to change any or all of the following items from the initial information block: A. Report width B. Report title C. Organization title D. Date information E. Project title F. Objective of the analysis G. Action officer
2. CHANGE THE DATA INFORMATION	2. Allows the user to change any or all of the following items from the data information block. A. Period of analysis B. Start year C. Base year D. Is it a housing analysis (Y/N) E. Discount rate F. Differential inflation index G. Residual schedule H. Analysis type
3. CHANGE THE ALTERNATIVE INFORMATION	3. Allows the user to add, change, or delete an alternative.
4. CHANGE THE GRAPH INFORMATION	4. Allows the user to add, change, or delete an alternative to be graphed.
5. CHANGE THE RANKING SENSITIVITY ANALYSIS INFORMATION	5. Allows the user to add, change, or delete a sensitivity analysis.

MAIN ECONPACK MENU OPTION 2: ADD TO OR CHANGE AND EXISTING FILE  
(Continued)

<u>OPTION NUMBER</u>	<u>EXPLANATION</u>
6. ALL INFORMATION	6. Allows the user to change each block of information in the order below: <ul style="list-style-type: none"><li>A. Initial information block</li><li>B. Data information block</li><li>C. Alternatives information block</li><li>D. Graphics information block</li><li>E. Ranking sensitivity information block</li></ul>
7. QUIT	7. Asks user if the editing session should be saved. Asks user if ECONPACK should be executed. If user answers yes to the latter question, execution takes place. If user answers no, user is returned to MAIN ECONPACK MENU.

4.4 MAIN ECONPACK MENU Option 3: Execute ECONPACK. Select this option when ready to perform an EA. User must know the name of the input file to be executed. A successful EA will take between 2 and 3 minutes per 100 lines of output. Running an EA will cost about \$14 per 100 input lines.

To use Option 3, follow these steps:

1. Select Option 3 from the MAIN ECONPACK MENU.
2. Enter the input filename when prompted.
3. Select the desired ECONPACK report (See below).

4.5 MAIN ECONPACK MENU Option 4: Print Economic Analysis Reports

This option allows the user to decide which reports should be printed. When Option 4 is selected, the following reports are available:

1. PRINT ENTIRE STANDARD OUTPUT REPORT
2. PRINT ENTIRE OUTPUT FILE FOR THE DD FORM 1391
3. PRINT SUMMARY REPORT
4. PRINT BY-YEAR REPORT
5. PRINT PLOTS
6. LIST INPUT DATA
7. PRINT SENSITIVITY ANALYSIS
8. RETURN TO ECONPACK MENU

Each option is now briefly described:

MAIN ECONPACK MENU OPTION 4: PRINT ECONPACK ANALYSIS REPORTS

<u>OPTION NUMBER</u>	<u>EXPLANATION</u>
1. PRINT ENTIRE STANDARD OUTPUT REPORT	1. Prints summary reports, by-year reports, plots, and input data.
2. PRINT ENTIRE OUTPUT FILE FOR THE DD FORM 1391	2. Prints the report which can be included in the DD Form 1391. It contains the Format A or A-1 and Format B outputs.
3. PRINT SUMMARY REPORT	3. Prints the net discounted present value, by alternative, by year, prints the uniform annual equivalent by alternative.

MAIN ECONPACK MENU OPTION 4: PRINT ECONOMIC ANALYSIS REPORTS  
(Continued)

<u>OPTION NUMBER</u>	<u>EXPLANATION</u>
4. PRINT BY-YEAR REPORT	4. Prints individual costs by year, discounted present value by year, cumulative net discounted present value by year for each alternative considered.
5. PRINT PLOTS	5. Prints the net discounted present values, by year, for each alternative graphed.
6. LIST INPUT DATA	6. Prints the executed file, line by line. This report is convenient for checking for typographical errors.
7. PRINT SENSITIVITY ANALYSIS	7. Prints the results of any sensitivity analysis performed. This report will tell if the ranking of alternatives changed as a result of the manipulations performed in the sensitivity analysis.
8. RETURN TO ECONPACK MENU	8. Returns the user to the MAIN ECONPACK MENU.

4.6 MAIN ECONPACK MENU Option 5: Check Manual Input File for Errors. This option allows the user to check an existing input file (whose name must be known) for syntax errors. Errors, by line number, will be listed. This option should only be used when data is entered by the file input mode, not when it is entered via the terminal prompting mode.

4.7 MAIN ECONPACK MENU Option 6: Help Facility. This option produces a menu which allows the user to get help for several categories. The options and their respective functions are listed in the next section.

## HELP FACILITY

<u>OPTION NUMBER</u>	<u>EXPLANATION</u>
1. ECONPACK GENERAL INSTRUCTIONS	1. Provides information on the following items: A. Purpose of ECONPACK B. Warnings on how to input data C. Types of input data needed D. On-line manual and contact points for help E. Instructions on how to halt execution
2. HOW TO USE ECONPACK UNDER PAX	2. Provides a summary of the MAIN ECONPACK MENU Options.
3. ECONPACK USER'S MANUAL (60 Pages)	3. Prints a 60 page User's Manual. This manual should be printed and read prior to using ECONPACK.
4. GLOSSARY OF TERMS	4. Provides a glossary of terms used in discussing economic analysis and ECONPACK.
5. SENSITIVITY ANALYSES	5. Provides a general explanation of the purpose of a sensitivity analysis and tells the user the two methods for conducting a sensitivity analysis.
6. REGULATION GUIDANCE ON EA	6. Discusses regulation guidance on economic analysis. Contact points are given for copies of the two regulations governing the use of economic analysis.
7. ECONNEWS	7. Provides a short update on ECONPACK.
8. RETURN TO ECONPACK MENU	8. Returns user to the MAIN ECONPACK MENU.

4.8 MAIN ECONPACK MENU Option 7: CMS. This option transfers the user to the Conversational Monitoring System. Detailed information on CMS is provided in Chapter 6.

4.9 MAIN ECONPACK MENU Option 8: Return to PAX MENU. Option 8 returns the user to the PAX menu which allows user to log off. One PAX Menu contains the following options:

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

LOG (CR) should be entered if the user is ready to end the computer session. Communications line should then be terminated. The user may also enter another option number to execute a different PAX option.

## CHAPTER 5 TERMINAL PROMPTING MODE

### 5 TERMINAL PROMPTING MODE

5.1 Introduction. This chapter is for analysts who wish to use the prompting mode rather than the file input mode. The terminal prompting mode is especially appropriate for the person who does not use ECONPACK frequently. Knowledge of creating a file using the Conversational Monitoring System (CMS) is unnecessary.

5.2 General. A sample interactive session in which a file is created is given in this chapter. The analyst must organize the input data so that it is readily available when the program requests it. The following outline for data/notes is recommended:

- Report title
- Organization title
- Project title
- Objective of analysis
- Period of analysis
- Start year
- Base year
- Inflation index schedule (if applicable)
- Residual schedule (if applicable)
- Type project (non-housing or housing)
- Type analysis (secondary or primary)
- For each alternative:
  - List of expense items and amounts
  - Salvage value (if applicable)
  - Source of data
  - Quantifiable benefits and source
  - Non-quantifiable benefits and source
- Titles of sensitivity analyses
- List of which expense items to change and limits on changes in sensitivity analyses.

5.2.1 Non-housing vs. Housing. The program gives prompts for the information needed to perform the EA. There are two key choices early in the prompting sequence which determine what kind of analysis is to be performed. One is:

DO YOU WISH TO DO A HOUSING ANALYSIS?

A "yes" answer allows the analyst several features which are not normally used in a non-housing analysis. These are:

- \* The option to include an inflation schedule. If an expense item(s) is expected to increase in price at a rate higher than the rate for the general economy, one may set up a schedule of the differential rate.
- \* The option to include a residual (salvage) value depreciation schedule. With this option, the program will calculate the residual value which would apply at any point during the period of analysis. It calculates this residual based on a user-selected preset type of depreciation, as well as a start value and time frame, also set by the user.
- \* The option to use other than mid-year discounting.

If a non-housing EA requires the above, the analysis should be done using the housing option.

A "no" answer results in a standard EA run, using a 10 percent (10%) discount rate, mid-year discounting, no inflation, and no residual schedules.

#### 5.2.2 Secondary vs. Primary. Another key question is:

ENTER THE ANALYSIS TYPE PRIMARY OR SECONDARY

This determines the type of special format reports that will be generated. For a primary, the Format A-1 report will be produced, while a Format A report will be produced for a secondary analysis.

#### 5.3 Sample Input Session. The following example demonstrates use of ECONPACK to interactively input a file for an EA:

The analyst lists the following information for easy reference when using ECONPACK:

Requirement - to house an additional 100 officers at Ft. Anywhere. There are three alternatives: construct new quarters, renovate existing buildings, or have them live on the economy in nearby towns.

Report title-Economic Analysis of Alternative Unaccompanied Officer Housing at Ft. Anywhere

Organization title - DEH, Ft. Anywhere

Project title - PN999



Objective of analysis - Provide housing for 100 additional officers

Period of analysis - 17 years. The housing is needed in 1992. It will take 2 years for new construction, starting in 1990 or one year for renovation, starting in 1991.

Start year - 1990 (first year in which costs occur)

Base year - 1990 (year for which all costs are converted to present value amounts)

Inflation index schedule - #1: For allowances - they are projected to escalate 2.2 percent above normal inflation each year, beginning in year 2.

Residual schedules -

#1: for new construction 0, 1 (1990, 1991), .985, .98, .975, .97, .965, .96, .955, .955, .955, .955, .95, .95, .94, .94.

#2: for renovation 0, 1 (1990, 1991), .97, .92, .87, .82, .77, .72, .65, .57, .5, .5, .45, .45, .45, .45, .45.

Alternative 1 - new construction

Construction costs - 2,500,000 1,500,000 15\*0 (\$0 for last 15 years)

O&M costs - \$50,000 per year after 2nd year of analysis period

Recarpet - \$44,000 in year 8 (year 10 of analysis period)

Reroof - \$125,000 in year 12 (year 14 of analysis period)

Salvage value - use residual schedule 1 for the total \$4,000,000

Source of data - DEH records and District Engineer

Alternative 2 - renovation

Renovation cost - \$3,500,000 in year 2 of analysis period

O&M costs - \$58,000 per year after 2nd year of analysis period

Recarpet - \$56,000 in year 8 (year 10 of analysis period)

Reroof - \$130,000 in year 6 (year 8 of analysis period)

Salvage value - use residual schedule 2 for the total \$3,500,000

Source of data - DEH records and District Engineer

Alternative 3 - economy housing

Allowances - \$360,000 per year starting in 1992

Administration - \$15,000 per year starting in 1992

Quantifiable benefits - none

Non-quantifiable benefits - for alternatives 1 and 2 -  
better morale and unit integrity per DCSPER Report  
XXXX2222

Graph - all three alternatives

Sensitivity analysis - Change O&M costs in alternative 2 by  
as much as 50 percent to assess its effect on rankings.

A sample interactive input session is presented in this section.  
The following paragraphs discuss the printout in detail.

5.3.1 Initial Information. The report title, organization, date  
of analysis, project title, objective and action officer are all  
given here. [Normally, also enter the telephone number of the  
action officer.]

In this example, the analyst prints out the initial information  
block for review. Information can be changed by entering "C".

5.3.2 Data Information. The total period of analysis is 17  
years--occupancy is in 1992 and construction begins in 1990 for  
alternative 1.

The start year is the first year of the period of analysis for  
which cost data are included. The base year is the year to which  
all costs will be converted to present value amounts.

One differential inflation index will be used for allowances. It  
is 2.2 percent per year and starts in 1991.

Two residual schedules are used--one for depreciating the new  
construction and one for the renovation.

5.3.3 Alternative Data. Note that the lives of the alternatives  
are 15 years beginning in 1992. For the residual calculations,  
end-of-year discounting is normally selected.

5.3.4 Graph Information. All three alternatives are selected  
for graphing.

5.3.5 Sensitivity Analysis. The analyst varies the O&M costs for renovation as much as 50 percent to see if this affects the ranking of the alternatives.

5.3.6 Other Prompting Sequences. The sequence given above exemplified a secondary housing analysis. The sequence is similar for a secondary housing analysis and for non-housing primary and secondary analyses.

The differences between the kinds of analyses are that some additional input data is requested for a primary housing analysis and less data for non-housing analyses.

5.4 Execution. Once all the information is entered, the analyst has the choice of executing ECONPACK with the new input file. If the response is "N" then the input file is saved and the analyst is returned to the MAIN ECONPACK MENU.

The standard report for this example is given in Appendix D.

5.6 Terminal Prompting Format. The sample terminal prompting session uses the following format:

1. User's response is underlined
2. (CR) means depress the CARRIAGE RETURN
3. Notes are provided, where appropriate, for the user's benefit.

5.7 Terminal Prompting Tasks.

- TASK 1: Log on to ECONPACK using Procedures 3.7.1.
- TASK 2: Choose Option 1 from the MAIN ECONPACK MENU.
- TASK 3: Create an input file by entering designated data when prompted.

SAMPLE INPUT FILE

STEP 1: Create The Initial Block.

COMPUTER'S RESPONSE: PLEASE ENTER YOUR INPUT-OUTPUT FILE NAME:

USER'S RESPONSE: >TRAIN (CR)

NOTES: The filename can be any string of letters, characters, symbols, etc., not to exceed eight characters (no spaces). If the user supplies an input filename which already exists, the current file created will replace the existing file. The system will assign the file a filetype.

COMPUTER'S RESPONSE: ENTER THE REPORT TITLE (5 LINES OF 48 CHARACTERS MAX):

USER'S RESPONSE:

>ECONOMIC ANALYSIS OF ALTERNATIVES FOR (CR)  
>UNACCOMPANIED OFFICER HOUSING AT FORT  
> ANYWHERE (CR)  
>(CR)

NOTES: Five lines were not needed for the report title, so the user depressed CR to go to the next prompt.

COMPUTER'S RESPONSE: ENTER THE ORGANIZATION TITLE (48 CHARACTERS MAX):

USER'S RESPONSE: >DEH, FT. ANYWHERE (CR)

NOTES: None

COMPUTER'S RESPONSE: ENTER THE DATE INFORMATION (48 CHARACTERS MAX):

USER'S RESPONSE: >1 JANUARY 1986 (CR)

NOTES: No date format is specified.

COMPUTER'S RESPONSE: ENTER THE PROJECT TITLE (48 CHARACTERS MAX):

USER'S RESPONSE: >PN999 (CR)

NOTES: None

COMPUTER'S RESPONSE: ENTER THE OBJECTIVE OF THE ANALYSIS  
(48 CHARACTERS MAX):

USER'S RESPONSE: >PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE ACTION OFFICER (40 CHARACTERS MAX):

USER'S RESPONSE: >JOHN SMITH, 217-555-5555 (CR)

NOTES: Include the phone number of the action officer.

COMPUTER'S RESPONSE: THIS COMPLETES THE INITIAL INFORMATION BLOCK.  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >C (CR)

NOTES: The user wishes to change some of the initial  
information block data.

COMPUTER'S RESPONSE: THE OUTPUT REPORT WIDTH IS 80 COLUMNS. ENTER THE  
NEW REPORT WIDTH OR <CR> TO LEAVE IT UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: Demonstrates the user does not want to change  
this entry.

COMPUTER'S RESPONSE: THE REPORT TITLE IS:  
ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT  
ANYWHERE. ENTER THE NEW REPORT TITLE OR <CR>  
TO LEAVE IT UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: THE ORGANIZATION TITLE IS: DEH, FT. ANYWHERE.  
ENTER THE NEW ORGANIZATION TITLE OR <CR> TO LEAVE  
IT UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: THE DATE INFORMATION IS: 1 JANUARY 1986.  
ENTER THE NEW DATE INFORMATION OR <CR> TO LEAVE  
IT UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: THE PROJECT TITLE IS:  
PN999  
ENTER THE NEW PROJECT TITLE OR <CR> TO LEAVE IT  
UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: THE OBJECTIVE OF THE ANALYSIS IS: PROVIDE HOUSING  
FOR 100 ADDITIONAL OFFICERS.  
ENTER THE NEW OBJECTIVE OR <CR> TO LEAVE IT  
UNCHANGED.

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: THE ACTION OFFICER IS JOHN SMITH, 217-555-5555.  
ENTER THE NEW ACTION OFFICER OR <CR> TO LEAVE IT  
UNCHANGED.

USER'S RESPONSE: >MR. JOHN SMITH, 217-555-5555 (CR)

NOTES: The user retyped the name of the action officer,  
inserting the title "Mr."

COMPUTER'S RESPONSE: THIS COMPLETES THE INITIAL INFORMATION BLOCK.  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: The user accepts the data as changed.

STEP 2: Create The Data Information Block.

COMPUTER'S RESPONSE: ENTER THE PERIOD OF ANALYSIS (60 YEARS MAX):

USER'S RESPONSE: >17 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE START YEAR OF THE ANALYSIS:

USER'S RESPONSE: >1990 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE BASE YEAR OF THE ANALYSIS  
(<CR> TO DEFAULT TO THE START YEAR):

USER'S RESPONSE: >(CR)

NOTES: Base year is accepted as 1990.

COMPUTER'S RESPONSE: DO YOU WISH TO DO A HOUSING ANALYSIS (Y/N)?

USER'S RESPONSE: >Y (CR)

NOTES: Enter Y for "yes" or N for "no."

COMPUTER'S RESPONSE: ENTER THE DISCOUNT RATE (<CR>) TO DEFAULT  
TO 10%):

USER'S RESPONSE: >(CR)

NOTES: ECONPACK uses a 10 percent discount rate unless  
user indicates otherwise at this prompt.

COMPUTER'S RESPONSE: DO YOU WISH TO ADD A DIFFERENTIAL INFLATION  
INDEX (Y/N)?

USER'S RESPONSE: >Y (CR)

NOTES: Enter Y for "yes" or N for "no".



COMPUTER'S RESPONSE: ENTER THE TITLE OF INDEX 1 (20 CHARACTERS MAX):

USER'S RESPONSE: >ALLOWANCES (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE VALUES (%) FOR INFLATION INDEX 1

USER'S RESPONSE: >0 16\*2.2(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE OF INFLATION INDEX 2 (20 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: The user desires only 1 inflation index.  
The user can have a maximum of 10 differential inflation indices.

COMPUTER'S RESPONSE: DO YOU WISH TO ADD A RESIDUAL SCHEDULE (Y/N)?

USER'S RESPONSE: >Y (CR)

NOTES: A maximum of 10 residual schedules may be added.

COMPUTER'S RESPONSE: ENTER THE TITLE OF RESIDUAL SCHEDULE 1 (20 CHARACTERS MAX):

USER'S RESPONSE: >NEW CONSTR RES (CR)

NOTES: The title of a residual schedule must correspond with the title of an alternative.

COMPUTER'S RESPONSE: ENTER THE VALUES FOR RESIDUAL SCHEDULE 1

USER'S RESPONSE: >0 1 .985 .98 .975 .97 .965 .96 (CR)  
>5\*.955 2\*.95 2\*.94 (CR)

NOTES: A maximum of 10 values per line may be used.

COMPUTER'S RESPONSE: ENTER THE TITLE OF RESIDUAL SCHEDULE 2  
(20 CHARACTERS MAX):

USER'S RESPONSE: >RENOVATION RES (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE VALUES FOR RESIDUAL SCHEDULE 2

USER'S RESPONSE: >0 1 .97 .92 .87 .82 .77 .72 .65 (CR)  
>.57 .52 .5 5\*.45 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE OF RESIDUAL SCHEDULE 3  
(20 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: The user does not want a third residual  
schedule.

COMPUTER'S RESPONSE: ENTER THE ANALYSIS TYPE PRIMARY OR  
SECONDARY (P/S):

USER'S RESPONSE: >S (CR)

NOTES: Enter P for "Primary" or S for "Secondary."

COMPUTER'S RESPONSE: THIS COMPLETES THE DATA INFORMATION BLOCK.  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >P (CR)

NOTES: The user wants to see what has been entered.

COMPUTER'S RESPONSE: THE PERIOD IS 17 YEARS.  
THE START YEAR IS 1990.  
THE BASE YEAR IS 1990.  
THIS IS A HOUSING ANALYSIS.  
THE DISCOUNT RATE IS 10.00%

THE TITLE OF INFLATION INDEX 1 IS ALLOWANCES  
THE VALUES (%) OF INFLATION INDEX 1 ARE:  
1\*0 16\*2.2

THE TITLE OF RESIDUAL SCHEDULE 1 IS NEW  
CONSTR RES  
THE VALUES OF RESIDUAL SCHEDULE 1 ARE:  
1\*0 1\*1 1\*0.985 1\*0.98 1\*0.975 1\*0.97 1\*0.965  
1\*0.96 5\*0.955 2\*0.95 2\*0.94

THE TITLE OF RESIDUAL SCHEDULE 2 IS  
RENOVATION RES  
THE VALUES OF RESIDUAL SCHEDULE 2 ARE:  
1\*0 1\*1 1\*0.97 1\*0.92 1\*0.87 1\*0.82 1\*0.77  
1\*0.72 1\*0.65 1\*0.57 1\*0.52 1\*0.5 5\*0.45

THE ANALYSIS TYPE IS SECONDARY

THIS COMPLETES THE DATA INFORMATION BLOCK.

ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: The user is satisfied with data entered and  
wants it to be accepted. Note the program  
displays the residual schedules using the  
shorthand notations, regardless of how the  
data were entered.

STEP 3: Create The Alternative Information Block.

COMPUTER'S RESPONSE: ENTER THE NAME OF ALTERNATIVE 1 (20 CHARACTERS MAX):

USER'S RESPONSE: >NEW CONSTRUCTION (CR)

NOTES: A maximum of 10 alternatives is allowed.

COMPUTER'S RESPONSE: ENTER THE TITLE OF ALTERNATIVE 1 (5 LINES OF 48 CHARACTERS MAX):

USER'S RESPONSE: >CONSTRUCT NEW QUARTERS FOR 100 OFFICERS (CR)  
>SITE WILL BE A VACANT AREA ON POST (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE ECONOMIC LIFE OF ALTERNATIVE 1:

USER'S RESPONSE: >15 (CR)

NOTES: The economic life does not have to be the same as the period of analysis. However, the economic life of each alternative must be equal.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 1 (3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >CONSTRUCTION (CR)  
>COST (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COST FOR EXPENSE ITEM 1:

USER'S RESPONSE: >2500000 1500000 15\*0 (CR)

NOTES: All cost data should be entered in actual dollars and not in thousands or millions of dollars. Do not use dollar signs or commas. The user must have a value for each year in the period of analysis.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 2 (3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >O&M (CR)  
>COSTS (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 2:

USER'S RESPONSE: >2\*0 15\*50000 (CR)

NOTES: No O&M costs are incurred in the construction phase.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 3 (3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >RECARPET (CR)  
>IN YEAR 8 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 3:

USER'S RESPONSE: >9\*0 44000 7\*0 (CR)

NOTES: Due to the 2-year construction phase, the 8th year of the economic life is the 10th year of the period of analysis.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 4 (3  
LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >REROOF (CR)  
>IN YEAR 12 (CR)  
>(CR)

NOTES: Adhere to line and character limitations.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 4:

USER'S RESPONSE: >13\*0 125000 3\*0 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 5 (3  
LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: User does not want a fifth expense item.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN A  
DIFFERENTIAL INFLATION FACTOR (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN  
A DISCOUNT FACTOR (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: DO YOU WISH TO INCLUDE SALVAGE (RESIDUAL)  
VALUE (Y/N)?

USER'S RESPONSE: >Y (CR)

NOTES: Enter Y for "yes" or N for "no."

COMPUTER'S RESPONSE: SELECT:

- 1) ONE TIME (AT THE END OF THE PERIOD OF ANALYSIS)
- 2) USE RESIDUAL SCHEDULE

USER'S RESPONSE: >2 (CR)

NOTES: Whatever method chosen should be used for all alternatives.

COMPUTER'S RESPONSE: SELECT:

- 1) STRAIGHT LINE
- 2) DECLINING BALANCE
- 3) YOUR OWN SCHEDULE

USER'S RESPONSE: >3 (CR)

NOTES: This prompt appears only if user chose Option 2 at the previous prompt.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL SCHEDULE NUMBER:

USER'S RESPONSE: >1 (CR)

NOTES: Remember, this schedule was created in the data information block.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL START VALUE:

USER'S RESPONSE: >4000000 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL INFLATION FACTOR (<CR> DEFAULTS TO NO INFLATION):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL DISCOUNT FACTOR (<CR>  
DEFAULTS TO 3): (1 = BEGINNING OF YEAR,  
2 = MIDDLE OF YEAR, 3 = END OF YEAR)

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS FOR ALTERNATIVE  
1 THAT ARE RECURRING COSTS:

USER'S RESPONSE: >2 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS FOR ALTERNATIVE 1  
THAT ARE INVESTMENT COSTS:

USER'S RESPONSE: >1 3 4 (CR)

NOTES: In the terminal prompting mode, all costs  
must be classified as either recurring or  
investment --in a secondary analysis.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF RECURRING COST  
(<CR> TO EXIT):

USER'S RESPONSE: >DEH RECORDS (CR)  
>(CR)

NOTES: DEH (Directorate of Engineering and Housing)

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NON-  
RECURRING COSTS (INVESTMENT) (<CR> TO EXIT):

USER'S RESPONSE: >DISTRICT ENGINEER OFFICE ESTIMATES AND (CR)  
>DEH RECORDS (CR)  
>(CR)

NOTES: None.



COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NET TERMINAL  
VALUE (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
CONSIDERATIONS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION COST  
INFORMATION FOR THE FORMAT A: SELECT  
ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: Format A is explained in Chapter 1.

COMPUTER'S RESPONSE: ENTER BENEFITS OF DOLLAR QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CF)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF OTHER QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF NON-QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >BETTER MORALE AND TROOP UNIT INTEGRITY (CR)  
>THAN IN ECONOMY HOUSING (CR)  
>(CR)

NOTES: A carriage return entered at the prompt will  
cause the system to continue the prompting  
routine.

COMPUTER'S RESPONSE: TO EDIT THE BENEFITS INFORMATION FOR THE  
FORMAT B: SELECT ACCEPT/CHANGE/PRINT  
(A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: Format B is explained in Chapter 1.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF DOLLAR  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
QUANTIFIABLE BENEFITS (<CR>TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NON-QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >DCSPER REPORT XXXX2222 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION OF  
BENEFITS INFORMATION FOR THE FORMAT B:  
SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: THIS COMPLETES THE DEFINITION OF ALTERNATIVE  
1 ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: ECONPACK now has all required information  
for Alternative 1.

COMPUTER'S RESPONSE: ENTER THE NAME OF ALTERNATIVE 2 (20  
CHARACTERS MAX):

USER'S RESPONSE: >RENOVATION (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE OF ALTERNATIVE 2 (5 LINES OF  
48 CHARACTERS MAX):

USER'S RESPONSE: >RENOVATE BLDGS 103, 104, AND 105 (CR)  
>DECREASE NUMBERS OF QUARTERS IN EACH BLDC (CR)  
>APPLY VINYL SIDING TO EXTERIORS (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE ECONOMIC LIFE OF ALTERNATIVE 2:

USER'S RESPONSE: >15 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 1  
(3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >RENOVATION (CR)  
>COST (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COST FOR EXPENSE ITEM 1:

USER'S RESPONSE: >0 3500000 15\*0 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 2 (3 LINES  
OF 12 CHARACTERS MAX):

USER'S RESPONSE: >O&M (CR)  
>COSTS (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 2:

USER'S RESPONSE: >2\*0 15\*58000 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 3 (3 LINES  
OF 12 CHARACTERS MAX):

USER'S RESPONSE: >RECARPET (CR)  
>IN YEAR 8 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 3:

USER'S RESPONSE: >9\*0 56000 7\*0 (CR)

NOTES: Year 8 of the economic life is year 10 in the period of analysis, per the statement of the problem on pages 5-2 through 5-4.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 4 (3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >REROOF (CR)  
>IN YEAR 6 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 4:

USER'S RESPONSE: >7\*0 130000 9\*0 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 5 (3 LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: There is no fifth expense item for Alternative 2.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN A DIFFERENTIAL INFLATION FACTOR (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: User expects all expense items to change at approximately the same rate as the general economy.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN  
A DISCOUNT FACTOR (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: User desires the "built in" 10 percent  
discount factor.

COMPUTER'S RESPONSE: DO YOU WISH TO INCLUDE A SALVAGE (RESIDUAL)  
VALUE (Y/N)?

USER'S RESPONSE: >Y (CR)

NOTES: Type Y for "yes" or N for "no."

COMPUTER'S RESPONSE: SELECT:  
1) ONE TIME (AT THE END OF THE PERIOD ANALYSIS)  
2) USE RESIDUAL SCHEDULE

USER'S RESPONSE: >2 (CR)

NOTES: None.

COMPUTER'S RESPONSE: SELECT:  
1) STRAIGHT LINE  
2) DECLINING BALANCE  
3) YOUR OWN SCHEDULE

USER'S RESPONSE: >3 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL SCHEDULE NUMBER:

USER'S RESPONSE: >2 (CR)

NOTES: User created this schedule on page 5-12.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL START VALUE:

USER'S RESPONSE: >3500000 (CR)

NOTES: This is the value of the asset after renovation.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL INFLATION FACTOR  
(<CR> DEFAULTS TO NO INFLATION):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE RESIDUAL DISCOUNT FACTOR  
(<CR> DEFAULTS TO 3): (1 = BEGINNING OF  
YEAR, 2 = MIDDLE OF YEAR, 3 = END OF YEAR)

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS FOR ALTERNATIVE  
2 THAT ARE RECURRING COSTS:

USER'S RESPONSE: >2 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS FOR ALTERNATIVE  
2 THAT ARE INVESTMENT COSTS:

USER'S RESPONSE: >1 3 4 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF RECURRING  
COSTS (<CR> TO EXIT):

USER'S RESPONSE: DEH RECORDS(CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NON-RECURRING  
COSTS (INVESTMENT) (<CR> TO EXIT):

USER'S RESPONSE: >DISTRICT ENGINEER ESTIMATES AND DEH RECORDS (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NET TERMINAL  
VALUE (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
CONSIDERATIONS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION COST  
INFORMATION FOR THE FORMAT A: SELECT  
ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.



COMPUTER'S RESPONSE: ENTER BENEFITS OF DOLLAR QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF OTHER QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF NON-QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >BETTER MORALE AND TROOP UNIT INTEGRITY (CR)  
>THAN FOR ECONOMY HOUSING (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE BENEFITS INFORMATION FOR THE  
FORMAT B: SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >P (CR)

NOTES: User wishes to view the data entered.

COMPUTER'S RESPONSE: BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:

N/A

OTHER QUANTIFIABLE BENEFITS:

N/A

NON-QUANTIFIABLE BENEFITS:

BETTER MORALE AND TROOP UNIT INTEGRITY  
THAN FOR ECONOMY HOUSING

SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: User is satisfied with data entered.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF DOLLAR  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NON-QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >DCSPER REPORT XXXX2222 (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION OF THE  
BENEFITS INFORMATION FOR THE FORMAT B:  
SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: THIS COMPLETES THE DEFINITION OF  
ALTERNATIVE 2  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE NAME OF ALTERNATIVE 3 (20  
CHARACTERS MAX):

USER'S RESPONSE: >ECONOMY HOUSING(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE OF ALTERNATIVE 3 (5  
LINES OF 48 CHARACTERS MAX):

USER'S RESPONSE: >NEW OFFICERS WOULD USE AVAILABLE (CR)  
>HOUSING IN SURROUNDING COMMUNITIES(CR)  
>(CR)

NOTES: Five lines were not needed.

COMPUTER'S RESPONSE: ENTER THE ECONOMIC LIFE OF ALTERNATIVE 3:

USER'S RESPONSE: >15 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 1(3  
LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >ALLOWANCES (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 1:

USER'S RESPONSE: >2\*0 15\*360000 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 2(3  
LINES OF 12 CHARACTERS MAX):

USER'S RESPONSE: >ADMINISTRATION (CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE COSTS FOR EXPENSE ITEM 2:

USER'S RESPONSE: >2\*0 15\*15000 (CR)

NOTES: Per the statement of the problem on pages  
5-2 through 5-4, the administration costs  
started in 1992.

COMPUTER'S RESPONSE: ENTER THE TITLE FOR EXPENSE ITEM 3 (3 LINES  
OF 12 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: Alternative 3 has only 2 expense items.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN  
A DIFFERENTIAL INFLATION FACTOR (<CR> TO  
EXIT):

USER'S RESPONSE: >1 (CR)

NOTES: User expects the "Allowances" expense  
item to rise faster than the general  
economy.

COMPUTER'S RESPONSE: ENTER THE DIFFERENTIAL INFLATION FACTOR  
FOR EXPENSE ITEM 1(<CR> DEFAULTS TO NO  
INFLATION):

USER'S RESPONSE: >1 (CR)

NOTES: The inflation index was created on page  
5-11.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN  
A DIFFERENTIAL INFLATION FACTOR (<CR> TO  
EXIT):

USER'S RESPONSE: >(CR)

NOTES: Only one expense item in this alternative is  
expected to change faster than the general  
economy.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEM NUMBER TO ASSIGN  
A DISCOUNT FACTOR (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: DO YOU WISH TO INCLUDE A SALVAGE (RESIDUAL)  
VALUE (Y/N)?

USER'S RESPONSE: >N (CR)

NOTES: Since Alternative 3 involves renting  
existing houses in the local economy, no  
assets were ever purchased/contracted.  
Hence, there will be no salvage value.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS FOR ALTERNATIVE 3  
THAT ARE RECURRING COSTS:

USER'S RESPONSE: >1 2 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF RECURRING  
COSTS (<CR> TO EXIT):

USER'S RESPONSE: >TABLE OF ALLOWANCES(CR)  
>DEH RECORDS(CR)  
>(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
CONSIDERATIONS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION COST  
INFORMATION FOR THE FORMAT A:  
SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF DOLLAR QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF OTHER QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER BENEFITS OF NON-QUANTIFIABLE  
BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE BENEFITS INFORMATION FOR THE  
FORMAT B: SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF DOLLAR  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF OTHER  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER SOURCE/DERIVATION OF NON-  
QUANTIFIABLE BENEFITS (<CR> TO EXIT):

USER'S RESPONSE: >(CR)

NOTES: None.

COMPUTER'S RESPONSE: TO EDIT THE SOURCE/DERIVATION OF THE  
BENEFITS INFORMATION FOR THE FORMAT B:  
SELECT ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: THIS COMPLETES THE DEFINITION OF ALTERNATIVE 3  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE NAME OF ALTERNATIVE 4 (20  
CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: A (CR) entered here signals the computer  
that all alternatives are identified and  
that the alternatives information block is  
complete.

STEP 4: Create The Graphics Information Block.

COMPUTER'S RESPONSE: ENTER THE ALTERNATIVE NUMBERS TO BE  
GRAPHED (<CR> TO EXIT):

USER'S RESPONSE: >1 2 3 (CR)

NOTES: User wishes all three alternatives to be  
graphed.

COMPUTER'S RESPONSE: THIS COMPLETES THE GRAPHING INFORMATION  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: Only one graph is currently available using  
the terminal prompting mode.

STEP 5: Create The Ranking Sensitivity Information Block.

COMPUTER'S RESPONSE: ENTER THE TITLE OF SENSITIVITY  
ANALYSIS NUMBER 1 (70 CHARACTERS MAX):

USER'S RESPONSE: >ANALYSIS OF CHANGES IN O&M COSTS  
FOR RENOVATION ALTERNATIVE (CR)

NOTES: All data should be entered on one line at  
this prompt.



COMPUTER'S RESPONSE: ENTER THE ALTERNATIVES TO BE INCLUDED IN  
THIS ANALYSIS:

USER'S RESPONSE: >1 2 3 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE ALTERNATIVE NUMBER WHOSE  
EXPENSE ITEMS YOU WISH TO CHANGE:

USER'S RESPONSE: >2 (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE EXPENSE ITEMS TO CHANGE FOR  
ALTERNATIVE NUMBER 2:

USER'S RESPONSE: >2 (CR)  
>(CR)

NOTES: User wishes to see what happens if O&M  
costs are varied.

COMPUTER'S RESPONSE: ENTER THE ALTERNATIVE NUMBER WHOSE  
EXPENSE ITEMS YOU WISH TO CHANGE:

USER'S RESPONSE: >(CR)

NOTES: User does not desire any other  
manipulations.

COMPUTER'S RESPONSE: ENTER THE UPPER LIMIT OF THE CHANGE  
(<CR> TO DEFAULT TO 200%):

USER'S RESPONSE: >50 (CR)

NOTES: User wants the upper limit of the O&M costs  
to vary by 50 percent.

COMPUTER'S RESPONSE: ENTER THE ALTERNATIVE NUMBER TO BE RANKED:

USER'S RESPONSE: >1 (CR)

NOTES: None.

COMPUTER'S RESPONSE: THIS COMPLETES THE DEFINITION OF  
SENSITIVITY ANALYSIS NUMBER 1.  
ENTER ACCEPT/CHANGE/PRINT (A/C/P):

USER'S RESPONSE: >A (CR)

NOTES: None.

COMPUTER'S RESPONSE: ENTER THE TITLE OF SENSITIVITY ANALYSIS  
NUMBER 2 (70 CHARACTERS MAX):

USER'S RESPONSE: >(CR)

NOTES: Although a maximum of 30 analyses may be  
performed on any one EA, the user desired  
only one sensitivity analysis for this  
particular EA.

COMPUTER'S RESPONSE: DO YOU WISH TO EXECUTE ECONPACK (Y OR N):

USER'S RESPONSE: >Y (CR)

NOTES: If user enters N, then the input file is  
saved and the analyst is returned to the  
MAIN ECONPACK MENU.

\*\*\*\*\* NOW GENERATING REPORTS

COMPUTER'S RESPONSE: WAIT WAIT WAIT WAIT

NOTES: WAIT messages are an indication of time  
required for execution. Normally, for  
analyses with five or less alternatives and  
five or less sensitivity analyses, no more  
than 10 WAIT messages appear. If more  
than 10 WAIT messages appear for this size  
analysis, stop execution and call Huntsville  
Division for assistance.

COMPUTER'S RESPONSE: AVAILABLE ECONPACK REPORTS

1. PRINT ENTIRE STANDARD OUTPUT FILE
2. PRINT ENTIRE OUTPUT FILE FOR THE DD  
FORM 1391
3. PRINT SUMMARY REPORT
4. PRINT BY-YEAR REPORT
5. PRINT PLOTS
6. LIST INPUT DATA
7. PRINT SENSITIVITY ANALYSIS
8. RETURN TO ECONPACK MENU

ENTER OPTION NUMBER ==>

USER'S RESPONSE:     [CHOOSE DESIRED REPORT OPTION NUMBER.] (CR)

NOTES:               After ECONPACK has printed the desired  
reports, perform the following tasks:

TASK 4:              Choose Option 8 from the AVAILABLE ECONPACK  
REPORTS menu, which appears after the  
requested reports are printed. System will  
return user to MAIN ECONPACK MENU.

TASK 5:              Choose Option 8 from the MAIN ECONPACK MENU.  
System will return user to the PAX menu.

TASK 6:              Log off using Procedure 3.7.3

## CHAPTER 6 CONVERSATIONAL MONITORING SYSTEM (CMS)

### 6 CMS

6.1 Introduction. Option 7 on the MAIN ECONPACK MENU is CMS. If the user selects this option, several commands are available which allow the user greater flexibility in creating input files, editing existing files, etc. In this chapter, the CMS commands are presented. A Quick Reference Guide is provided which gives users the name, general function, and page number of the detailed description of each CMS command. Beginning on page 6-5, a detailed description is presented for each CMS command. The presentation of each command is divided into six major sections, as Figure 6-1 illustrates.

Figure 6-1. Presentation of A CMS Command

```
1 CMS COMMAND
2 : QUERY :
3 FORMAT:      QUERY keyword
4 PARAMETERS: keyword: NAMES
                  specific system user ID
                  TIME
                  TRN
                  USERS
                  DISK
5 NOTES:      None.
6 VARIATION A: QUERY NAMES
6a FUNCTION:    System prints a list of all System User IDs
                  currently logged on to the PAX System.
6b EXAMPLE:
    Command issued:      C>QUERY NAMES (CR)
    Computer's response:
CAP006  -EF1, FRED  -DE8, V3MCC  -DEL, LACEE  -DSC
MAURICE  -DSC, SHARP5 -EE6, BIRD  -EE3, NELSON -DEA
CAPSINK  -DSC, V3NAF -DF8, DARWIN -DF3, CHUCK2N -EF-
    Summary:      The system printed a list of all System
User IDs currently logged on to the
PAX System.
VARIATION B: QUERY Specific system user ID.
FUNCTION:    System verifies whether the specified System
User ID is currently logged on to the PAX System.
EXAMPLE 1:
    Command issued:      C>QUERY BIRD (CR)
    Computer's response: BIRD  -EE3
```

Each section is described below:

- (1) CMS Command - Identifies the name of the command category.
- (2)            - Contains the name of the command.
- (3) FORMAT - Specifies the format in which the command must be issued. The following symbols are used to describe the format.

UPPERCASE LETTERS - Indicate exact words or abbreviated form must be entered.

LOWERCASE LETTERS - Indicate parameters entered in the command format as described below in Section (4) - PARAMETERS.

Note: Uppercase and lowercase letters are used for illustrative purposes only. Commands can be entered in either uppercase or lowercase letters.

PARENTHESES - Indicate optional parameters. They are for illustrative purposes only and should not be typed when optional parameters are specified.

- (4) PARAMETERS - Specify additional information the user may have to include.

- (5) NOTES - Provide the user with additional information.

- (6) VARIATIONS - Each variation of a command is described in detail. This section specifies the specific format of the variation (6), describes the function (6a), and provides an example (6b). In the example, underlining indicates data to be entered by the user. A (CR) indicates the user must hit the carriage return key.

QUICK REFERENCE GUIDE  
CMS COMMANDS

---

<u>COMMAND</u>	<u>FUNCTION</u>	<u>PAGE</u>
1. COPY	Creates a new file on the ECONPACK permanent disk containing a duplicate copy of the specified existing file.	6-5
2. <u>ECONPACK</u>	Returns the user to the MAIN ECONPACK MENU.	6-6
3. <u>EDIT</u>	Creates a temporary file, prints NEW FILE:, and prompts the user for a text editor command.	6-7
4. ERASE	Deletes the specified file from the ECONPACK permanent disk and prompts for another CMS command.	6-9
5. IBM	Changes the line editor from the QED editor to the IBM editor.	6-10
6. <u>LIST</u>	Prints a list of files entered on the user's storage space on the permanent disk. Variations of the command will print all the files with the specified filetype.	6-11
7. LISTR	Prints specific information about the files on the user's storage space on the ECONPACK permanent disk. The list is arranged alphabetically according to filetype. Variations of the command will print information only for files with the specific filename or filetype. The listing includes the following information: filename, filetype, file mode, line format, number of lines, number of blocks of storage space used, and the date and time the file was created or last modified.	6-14
8. LISTS	Same as LISTR except the list is arranged in alphabetical order according to filenames.	6-18
9. LOG	Exits the CMS environment and returns to the PAX System Menu prompt.	6-22

NO-A165 931

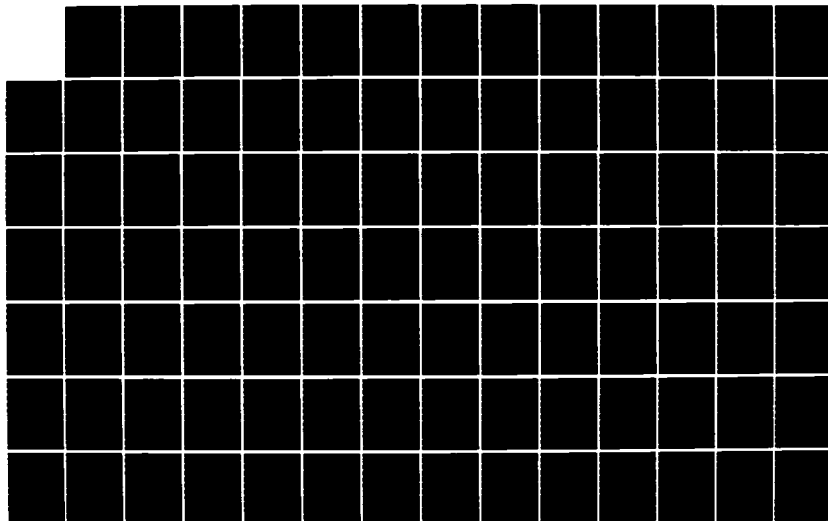
PAX ECONOPACK ECONOMIC ANALYSIS PACKAGE USER'S MANUAL  
(U) ARMY ENGINEER DIV HUNTSVILLE AL H W MASON JAN 86  
HNDSP-86-117-ED-ES

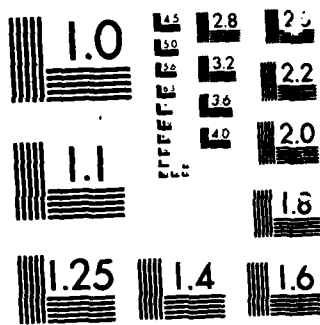
2/3

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A



<u>COMMAND</u>	<u>FUNCTION</u>	<u>PAGE</u>
10. MSG	Allows a user to send a one-line message to another user currently logged on to the PAX system. The message cannot be longer than 130 characters or contain more than 13 words. Each word cannot contain more than 8 characters.	6-23
11. QED	Changes from the IBM editor to the QED editor.	6-25
12. <u>QUERY</u>	Prints information concerning the system such as the specific System User IDs which are currently logged on to the PAX System.	6-26
13. <u>RENAME</u>	Changes the filename and filetype of an existing file on the ECONPACK permanent disk to the specified new filename and filetype.	6-29
14. SET	Prevents messages sent as a result of the MSG command from being printed at the user's terminal. The system notifies the sender that the receiver is not receiving messages.	6-30
15. <u>SLEEP</u>	Allows messages sent by the CMS Command MSG to be printed at the user's terminal as soon as they are sent. The user does not need to enter a carriage return to receive the messages.	6-31
16. <u>TYPE</u>	Prints the contents of the specified ECONPACK permanent disk file.	6-32

CMS COMMAND

COPY

FORMAT: COPY fn1 ft1 A fn2 ft2 A

PARAMETERS: fn1 ft1: The filename and filetype of an existing ECONPACK permanent disk file.

fn2 ft2: The filename and filetype of the new duplicate file to be entered on the user's ECONPACK permanent disk.

A: File mode.

NOTES: If fn2 ft2 currently exists, then the existing file must be erased prior to copying the fn1 ft1 file.

FUNCTION: The system creates a new file on the ECONPACK permanent disk containing a duplicate copy of the specified existing file.

EXAMPLE:

Command issued: C>COPY TEST FT80F001 A TEST2 FT80F001 A (CR)

Computer's response: C>

Summary: The system made a duplicate copy of the contents of the file TEST FT80F001, entered it in a new file named TEST2 FT80F001, and prompted the user at the C>.

CMS COMMAND

ECONPACK

FORMAT: ECONPACK

PARAMETERS: None

FUNCTION: This command returns the user to the MAIN  
ECONPACK MENU.

EXAMPLE:

Command issued: C>ECON (CR)

Computer's response:

\*\*\* MAIN ECONPACK MENU \*\*\*

1. CREATE AN INPUT FILE
2. ADD TO OR CHANGE AN EXISTING INPUT FILE
3. EXECUTE ECONPACK
4. PRINT ECONOMIC ANALYSIS REPORTS
5. CHECK MANUAL INPUT FILE FOR ERRORS
6. HELP FACILITY
7. CMS
8. RETURN TO PAX MENU

ENTER DESIRED OPTION>

Summary: The system returned to the MAIN ECONPACK MENU  
and prompted the user to enter a menu option  
number.

## CMS COMMAND

### EDIT

FORMAT:        EDIT fn ft

PARAMETERS:    fn ft:    The filename (fn) and filetype (ft) used to identify the file on the ECONPACK permanent disk.

Note: Both the filename and filetype can contain a maximum of eight characters; each character can be a letter, a digit, a period (.), or a dollar sign (\$). Neither may contain a blank space.

- NOTES:
1. Whenever accessing a file on the permanent disk, the user must enter both the filename and filetype.
  2. For organizational purposes, it is recommended the user enter a filename and filetype that reflect the content of the file.
  3. FT75F001 = Input file  
    FT76F001 = Standard report  
    FT80F001 = Primary and/or secondary analysis report

FUNCTION 1:    If a permanent file with the specified filename and filetype does not exist, the system creates a temporary file, prints NEW FILE:, and prompts the user for a text editor command.

Note: The temporary file will become a permanent file after the text editor command FILE is issued.

### EXAMPLE:

Command issued:        C>EDIT COMMENT 1 (CR)

Computer's response:    NEW FILE:  
                          E>

Summary:                The system created a temporary file, printed NEW FILE: to notify the user the file was new, and prompted for a text editor command.

EDIT (Cont.)

FUNCTION 2: If a permanent file with the specified filename and filetype exists on the permanent disk, the system creates a duplicate temporary file and prompts the user for a text editor command.

Note: Any modifications to the temporary file will not become part of the permanent file until the text editor command FILE is issued.

EXAMPLE:

Command issued: C>EDIT COMMENT 3 (CR)

Computer's response: E>

Summary: The system created a duplicate temporary file for the existing file, COMMENT 3, and prompted the user for a text editor command.

## CMS COMMAND

### ERASE

FORMAT: ERASE fn ft

PARAMETERS: fn ft: Filename and filetype of the file to be deleted.

NOTES: None.

FUNCTION: The system deletes the specified file from the ECONPACK permanent disk and prompts for another CMS command.

#### EXAMPLE:

Command issued: C>ERASE D1BAR MEMO (CR)

Computer's response: C>

Summary: The system deleted the file, D1BAR MEMO, from the user's permanent disk and prompted the user for a CMS command.

## CMS COMMAND

IBM

FORMAT: IBM

PARAMETERS: None.

NOTES: This command need only be entered if the system is operating in the QED edit mode and the user wishes to use the IBM edit mode.

FUNCTION: The system changes to the IBM editing mode and prompts for another CMS command.

### EXAMPLE:

Command issued: C>IBM (CR)

Computer's response: The IBM edit mode will automatically be used for this and subsequent terminal sessions. This selection may be changed to the QED edit mode at any time by typing "QED" at the CMS (C>) prompt.

The following commands are applicable in this mode:

1. @ = DELETES A CHARACTER.
2. [ = DELETES THE ENTIRE LINE.

Summary: The system changed the user's edit mode to IBM and returned to the C prompt.

## CMS COMMAND

### LIST

FORMAT:       \*   \*  
                  LIST (fn) (ft)

PARAMETERS:   fn: The filename of an existing file on the  
                              ECONPACK permanent disk.

                  ft: The filetype of an existing file on the  
                              ECONPACK permanent disk.

                  \* : An asterisk denoting "all".

NOTES:

1. All variations of this command list only those files located on the user's storage space on the ECONPACK permanent disk.
2. All files appearing on the list are not created by users at the activity. Some of the files are required for programming purposes and cannot be removed by the user.

### VARIATION A:   LIST

FUNCTION:       The system prints a list of all files entered  
                              on the user's storage space on the ECONPACK  
                              permanent disk.

### EXAMPLE:

Command issued:       C>LIST (CR)

Computer's response:   DOFCPRS   STATUS   A1  
                          FILE       FT80F001   A1  
                          FNI       FTI       A1  
                          FN4       FN4.       A1  
                          LOAD       MAP       A5  
                          NEW       FILE       A1  
                          PROFILE   EXEC       A1

C>

Summary:           The system printed a list of all files  
                              on the user's storage space on the ECONPACK  
                              permanent disk.



LIST (Cont.)

VARIATION B: LIST fn ft

FUNCTION: If the file specified by its filename and file-type is entered on the user's storage space on the ECONPACK permanent disk, the system will print its filename and filetype.

EXAMPLE:

Command issued: C> LIST SR MEMO (CR)

Computer's response: SR2 MEMO A1  
C>

Summary: The system listed the specified file on the user's storage space on the ECONPACK permanent disk.

VARIATION C: LIST fn \*

FUNCTION: The system lists all files which have been assigned the specified filename.

EXAMPLE:

Command issued: C> LIST COMMENT \* (CR)

Computer's response: COMMENT ONE A1  
COMMENT THREE A1  
COMMENT TWO A1

Summary: The system listed all files containing the filename COMMENT.

LIST (Cont.)

VARIATION D: LIST \* ft

FUNCTION: The system lists all files which have been  
assigned the specified filetype.

EXAMPLE:

Command issued: C>LIST \* MEMO (CR)

Computer's response: ADMIN MEMO  
BARRACKS MEMO  
HOSP MEMO  
SR2 MEMO

Summary: The system listed all the files which  
contained the filetype MEMO.

## CMS COMMAND

### LISTR

FORMAT:        \*   \*  
LISTR (fn)(ft)

PARAMETERS:   fn:   The filename of an existing file on the  
                     ECONPACK permanent disk.

                     ft:   The filetype of an existing file on the  
                             ECONPACK permanent disk.

\* :   An asterisk.

NOTES:        1.   The LISTR command provides the following  
                     information on each file:

FILENAME        The filename of an existing file  
                     on the permanent disk.

FILETYPE        The filetype of an existing file on  
                     the permanent disk.

FM               File mode.

FORMAT          The file's format. Most files will  
                     have an "F". This indicates the  
                     length of each record or line.

LRECL           Line record length - 80 characters.

RECS            The number of records in the file.

BLOCK           The storage space on the permanent  
                     disk is divided into blocks, each  
                     block containing 10 records or lines.  
                     The number entered under this heading  
                     indicates the number of blocks  
                     currently being occupied by the file.

DATE            The date the file was created or last  
                     modified.

TIME            The time of day the file was created  
                     or last modified.

LISTR (Cont.)

2. All variations of this command list only those files located on the user's storage space on the permanent disk.

3. All files appearing on the list are not created by users at the activity. Some of the files are required for programming purposes and cannot be removed by the user.

VARIATION A: LISTR

FUNCTION: The system prints a list of all files on the user's storage space on the permanent disk. The list is arranged alphabetically according to the filetypes and includes specific information on each file.

EXAMPLE:

Command issued: C>LISTR (CR)

Computer response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
EDIT	CHOICE	A1	V	3	1	1/11/86	23:26:
+ABEND	EXEC	A1	V	40	22	1/11/86	23:29:
PROFILE	EXEC	A1	V	22	11	9/11/85	5:44:
SALLY	FT75F001	A1	F	80	34	1/08/86	19:05:
TEST	FT75F001	A1	F	80	247	1/11/86	15:57:
SALLY	FT76F001	A1	F	133	56	1/08/86	19:05:
TEST	FT76F001	A1	F	133	729	1/11/86	15:37:
SALLY	FT80F001	A1	F	80	1	1/08/86	19:05:
TEST	FT80F001	A1	F	80	266	1/11/86	15:37:

C>

Summary: The system printed various types of information about all the files on the user's storage space on the permanent disk. The list was organized alphabetically according to the filetypes.

LISTR (Cont.)

VARIATION B:        LISTR fn ft

FUNCTION:        The system prints information pertaining to the  
                     file specified by its filename and filetype.

EXAMPLE:

Command issued:        C>LISTR TEST FT80F001 (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
TEST	FT80F001	A1	F	80	266	21	1/11/86 15:37:

C>

Summary:                The system printed information for the  
                             specified file TEST FT80.

VARIATION C: LISTR fn \*

FUNCTION:        The system prints information pertaining to all  
                     files which have been assigned the specified  
                     filename.

EXAMPLE:

Command issued:        C>LISTR TEST \*

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
TEST	FT75F001	A1	F	80	247	20	1/11/86 15:57:
TEST	FT76F001	A1	F	133	729	95	1/11/86 15:37:
TEST	FT80F001	A1	F	80	266	21	1/11/86 15:37:

C>

Summary:                The system printed information regarding  
                             all files containing the filename TEST.

LISTR (Cont.)

VARIATION D:   LISTR \* ft

FUNCTION:    The system prints information pertaining to all  
files which have been assigned the specified  
filetype.

EXAMPLE:

Command issued:       C>LISTR \* FT80F001 (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
SALLY	FT80F001	A1	F	80	1	1/08/86	19:05:
TEST	FT80F001	A1	F	80	266	1/11/86	15:37:

C>

Summary:               The system printed information regarding  
all files containing the filetype  
FT80F001.

CMS COMMAND

LISTS

FORMAT:           \*   \*  
LISTS (fn) (ft)

PARAMETERS:   fn:   The filename of an existing file on the  
                          ECONPACK permanent disk.

                  ft:   The filetype of an existing file on the  
                          ECONPACK permanent disk.

\* :   An asterisk denoting "all".

NOTES:           1. The LISTS command provides the following  
                          information on each file listed:

FILENAME       The filename of an existing file on  
                  the permanent disk.

FILETYPE       The filetype of an existing file on  
                  permanent disk.

FM             File mode.

FORMAT         The file's line format. Most files  
                  will have an "F". This means that  
                  the length of each record, or line,  
                  is "fixed" (F).

LRECL          Line record length - 80 characters.

RECS           The number of records or lines in the  
                  file.

BLOCK          Storage space on the permanent disk  
                  is divided into blocks; each block  
                  containing 10 lines. The number  
                  entered under this heading indicates  
                  the number of blocks currently being  
                  occupied by the file.

DATE           The date the file was created or last  
                  modified.

TIME           The time of day the file was created  
                  or last modified.

LISTS (Cont.)

2. All variations of this command list only those files located on the user's storage space on the permanent disk.

3. All files appearing on the list are not created by users at the activity. Some of the files are required for programming purposes and cannot be removed by the user.

VARIATION A: LISTS

FUNCTION: The system prints a list of all files on the user's storage space on the permanent disk. The list is arranged alphabetically according to the filenames and includes specific information pertaining to each file.

EXAMPLE:

Command issued: C>LISTS (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
+ABEND	EXEC	A1	V	40	22	1	1/11/86 23:29:
SALLY	FT75F001	A1	F	80	34	3	1/08/86 19:05:
SALLY	FT76F001	A1	F	133	56	8	1/08/86 19:05:
SALLY	FT80F001	A1	F	80	1	1	1/08/86 19:05:
EDIT	CHOICE	A1	V	3	1	1	1/11/86 23:26:
PROFILE	EXEC	A1	V	22	11	1	9/13/85 5:44:
TEST	FT75F001	A1	F	80	247	20	1/11/86 15:57:
TEST	FT76F001	A1	F	133	729	95	1/11/86 15:37:
TEST	FT80F001	A1	F	80	266	21	1/11/86 15:37:

Summary: The system printed various types of information pertaining to all the files on the user's storage space on the permanent disk. The list was organized alphabetically according to the filename.



LISTS (Cont.)

VARIATION B: LISTS fn ft

FUNCTION: The system prints information pertaining to the file specified by its filename and filetype.

EXAMPLE:

Command issued: C>LISTS TEST FT80F001 (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
TEST	FT80F001	A1	F	80	266	21	1/11/86 15:37:

C>

Summary: The system printed information about the specified file TEST FT80F001.

VARIATION C: LISTS fn \*

FUNCTION: The system prints information pertaining to all files which have been assigned the specified filename.

EXAMPLE:

Command issued: C>LISTS TEST \* (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
TEST	FT75F001	A1	F	80	247	20	1/11/86 15:57:
TEST	FT76F001	A1	F	133	729	95	1/11/86 15:37:
TEST	FT80F001	A1	F	80	266	21	1/11/86 15:37:

C>

Summary: System printed information related to all files containing the filename TEST.

LISTS (Cont.)

VARIATION D: LISTS \* ft

FUNCTION: The system prints information pertaining to all files which have been assigned the specified filetype.

EXAMPLE:

Command issued: C>LISTS \* FT80F001 (CR)

Computer's response:

FILENAME	FILETYPE	FM	FORMAT	RECS	BLOCKS	DATE	TIME
SALLY	FT80F001	A1	F	80	1	1/08/86	19:05:
TEST	FT80F001	A1	F	80	266	1/11/86	15:37:

C>

Summary: The system printed information pertaining to all files containing the filetype FT80F001.

CMS COMMAND

LOG

FORMAT: LOG

PARAMETERS: None.

NOTES: None.

FUNCTION: The system returns to the PAX System and prompts for a selection from the PAX System Menu.

Note: Before returning to the PAX System, the computer prints the amount of clock time (CONNECT) and computer time (TRU) the user has used since accessing the ECONPACK System.

EXAMPLE:

Command issued: C>LOG (CR)

Computer's response:

\*\*\* LEAVING ECONPACK \*\*\*

PROJECT ECON  
CONNECT= 00:57:40 TRU= 22.70 TIO= 8,102

PAX SYSTEM MENU

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

PAX>

Summary: The system returned to the PAX System and prompted the user for a response.

## CMS COMMAND

### MSG

FORMAT: MSG user ID message

PARAMETERS: user ID: System User ID for user currently logged on to the computer.

message: A one line message with the following characteristics:

1. It cannot contain more than 130 characters.
2. It cannot contain more than 13 words.
3. Each word cannot contain more than 8 characters.

NOTES:

1. The CMS command QUERY NAMES will list the IDs for all users of PAX currently logged on to the system. Any of the IDs listed can be sent a message by the MSG command.
2. If the system User's ID is unknown, the DD Form 1391 Processor System time-of-day command WHOISIT can be used to obtain the ID of a particular activity.
3. A user can lock out incoming MSGs from other users by issuing the CMS command SET MSG OFF.
4. The user issuing the MSG command is not notified when the user to whom the message was sent receives it. The user is notified if the user to whom the message was sent is not logged on to the computer.

FUNCTION: The system prints the MSG as soon as the user to whom it was sent enters a carriage return.\*

\*A user need not enter a carriage return to receive a MSG if the CMS command SLEEP is in effect.

MSG (Cont.)

EXAMPLE:

Command issued:

C>MSG BIRD THANKS FOR QUICK RESPONSE TO PROBLEM. (CR)

Computer's response to sender: C>

Computer's response to receiver after a carriage return is entered:

MSG FROM TRAIN5 : THANKS FOR QUICK RESPONSE TO PROBLEM.

Summary:

The system stored the message until the receiver entered a carriage return. When the receiver hit a carriage return, the system then printed the ID of the user who sent the message and the message.

# CMS COMMAND

QED

FORMAT: QED

PARAMETERS: None.

NOTES: There are two "editing modes," the IBM and the QED, in which the system may operate. These editing modes only affect the methods of deleting characters from a data line BEFORE the carriage return key has been depressed.

FUNCTION: The system changes to the QED editing mode and prompts for another command.

## EXAMPLE:

Command issued: C>QED (CR)

Computer's response:

THE QED EDIT MODE WILL AUTOMATICALLY BE USED FOR THIS AND SUBSEQUENT TERMINAL SESSIONS. THIS SELECTION MAY BE CHANGED TO THE IBM EDIT MODE AT ANY TIME BY TYPING "IBM" AT THE CMS (<C>) PROMPT.

THE FOLLOWING COMMANDS ARE APPLICABLE IN THIS MODE:

1. CONTROL A = FOR CHARACTER DELETION
2. CONTROL W = FOR WORD DELETION
3. CONTROL Q = FOR LINE DELETION
4. CONTROL R = FOR PRINTING REVISED LINE BEFORE ENTERING A CARRIAGE RETURN

C>

Summary: The system changed to the QED editing mode and prompted the user with a C prompt.

CMS COMMAND

QUERY

FORMAT: QUERY keyword

PARAMETERS: keyword: NAMES  
specific system user ID  
TIME  
TRU  
USERS  
DISK

NOTES: None.

VARIATION A: QUERY NAMES

FUNCTION: System prints a list of all System User IDs  
currently logged on to the PAX System.

EXAMPLE:

Command issued: C>QUERY NAMES (CR)

Computer's response:

CAPO06 -EF1, FRED -DE8, V3MCC -DED, LACEE -DSC  
MAURICE -DSC, SHARP5 -EE6, BIRD -EE3, NELSON -DEA  
CAPSINK -DSC, V3NAF -DF8, DARWIN -DF3, CHUCK2N -EF4

Summary: The system printed a list of all System  
User IDs currently logged on to the  
PAX System.

VARIATION B: QUERY Specific system user ID.

FUNCTION: System verifies whether the specified System  
User ID is currently logged on to the PAX System.

EXAMPLE 1:

Command issued: C>QUERY BIRD (CR)

Computer's response: BIRD -EE3

QUERY (Cont.)

Summary: The system confirmed the System User ID. BIRD was currently logged on to the PAX System.

EXAMPLE 2:

Command issued: C>QUERY BIRD (CR)

Computer's response: DMKCQG045E BIRD NOT LOGGED ON

Summary: The system notified the user that the ID. BIRD was not currently logged on to the computer.

VARIATION C: QUERY TIME

FUNCTION: The system displays the current time, the date, and the amount of connection time since the user accessed the ECONPACK System at the PAX Menu prompt.

EXAMPLE:

Command issued: C>QUERY TIME (CR)

Computer's response:

TIME IS 14:45:32 CDT WEDNESDAY 01/08/86  
CONNECT= 01:02:31: VIRTCPU = 000:00.98 TOTCPU= 000:04:13

Summary: The system specified the total clock time (hours, minutes, seconds) the user had been logged on to the ECONPACK System component of the PAX System.



QUERY (Cont.)

VARIATION D: QUERY TRU

FUNCTION: The system lists the total clock time (hours, minutes, seconds) and the number of TRUs used since the user accessed the ECONPACK System at the PAX Menu prompt.

EXAMPLE:

Command issued: C>QUERY TRU (CR)

Computer's response:

PROJECT ECON

CONNECT= 01:02:41 TRU= 32.19 TIO= 23,338

Summary: The system specified the connection time and the amount of TRUs used since the user accessed the ECONPACK System.

VARIATION E: QUERY USERS

FUNCTION: The system lists the number of users currently logged on to the PAX System.

EXAMPLE:

Command issued: C>QUERY USERS (CR)

Computer's response: 028 USERS, 000 DIALED

Summary: System specified the number of users currently logged on to the PAX System.

VARIATION F: QUERY DISK

FUNCTION: The system displays information regarding the user's ECONPACK central disk files.

EXAMPLE:

Command issued: C>QUERY DISK (CR)

Computer's response:

LABEL	CUU	M	STAT	BLK- SIZE	FILES	BLKS- USED-(%)	BLKS- LEFT	BLK- TOTAL
HNDECO	302	A	R/W	1024	35	869-42	1221	2090
TAFT	411	B	R/O	1024	30	2911-35	5449	8360
ACSLIB	191	P	R/O	1024	160	4172-50	4188	8360
UPL370	500	R	R/O	1024	316	6232-85	1083	7315
CMS190	190	S	R/O	4096	281	3033-95	159	3192
CMS19E	19E	Y/S	R/O	2048	285	6893-76	2227	9120

C>

Summary: The system displayed information about  
the user's ECONPACK central disk files.

CMS COMMAND

RENAME

FORMAT:        RENAME fn1 ft1 A fn2 ft2 A

PARAMETERS:   fn1 ft1: The filename and filetype of an  
existing ECONPACK permanent disk file.

                  fn2 ft2: The filename and filetype to replace  
the existing name and filetype of an  
ECONPACK permanent disk file.

                  A: File mode.

NOTES:        The contents of the specified file are not  
affected by this command.

FUNCTION:     The system changes the filename and filetype  
of an existing file on the ECONPACK permanent  
disk to the specified new filename and file-  
type.

EXAMPLE:

Command issued:        C>RENAME COST MEMO A COSTHIGH MEMO A (CR)

Computer's response: C>

Summary:            The system changed the title of the  
file, COST MEMO, to COSTHIGH MEMO and  
prompted the user for another CMS command.

## CMS COMMAND

### SET

FORMAT: SET MSG setting

PARAMETERS: MSG: Refers to the printing of a message at the user's terminal as the result of the MSG command.

setting: OFF  
ON

#### VARIATION A: SET MSG OFF

FUNCTION: The system prevents messages sent as a result of the MSG command from being printed at the user's terminal. The system notifies the sender that the receiver is not receiving messages.

#### EXAMPLE:

Command issued: C>SET MSG OFF (CR)

Computer's response: C>

Summary: The system will prevent any messages from printing at the user's terminal and will notify the user sending a MSG that the user is not receiving messages. MSG will be set off until the command MSG SET ON is issued.

#### VARIATION B: SET MSG ON

FUNCTION: The system prints messages sent as a result of the MSG command. The system automatically sets MSG ON when the user logs on to the computer. The only time the user needs to enter this command is to cancel the effects of a previously entered SET MSG OFF command.

SET (Cont.)

EXAMPLE:

Command issued: C>SET MSG ON (CR)

Computer's response: C>

Summary: The system cancelled the effects of the  
SET MSG OFF command.

## CMS COMMAND

### SLEEP

FORMAT: SLEEP

PARAMETERS: None.

NOTES: The user cannot enter commands while the SLEEP command is in effect.

FUNCTION: The system allows messages sent by the CMS command MSG to be printed at the user's terminal as soon as they are sent; the user does not need to enter a carriage return to receive the message(s). Sleep remains in effect until the user terminates it. To do this, the user must hit either the escape key or the alt mode key twice.

### EXAMPLE:

Command issued: C>SLEEP (CR)

Computer's response: --

Summary: The system is "set" to print a MSG as soon as it is sent. To return to the C>, the user should hit the ESCAPE key twice.

CMS COMMAND

: TYPE :

FORMAT: TYPE fn ft

PARAMETERS: fn: The filename of an existing file on the  
ECONPACK permanent disk.

ft: The filetype of an existing file on the  
ECONPACK permanent disk.

FUNCTION: The system prints the contents of the specified  
file and prompts for another CMS command.

EXAMPLE:

Command issued: C>TYPE COST MEMO (CR)

Computer's response: THE COST ESTIMATE FOR THE PRIMARY  
FACILITY APPEARS TOO HIGH. SEND  
ADDITIONAL INFORMATION.  
J.H.B.

Summary: The system printed the contents of the  
file, COST MEMO, and prompted for  
another CMS command.

## CHAPTER 7 FILE INPUT MODE

### 7 FILE INPUT MODE

7.1 Introduction. This chapter is for analysts who choose to create their input file(s) using the CMS editor on the TYMSHARE system. This chapter presents the details of required input for doing an ECONPACK EA run. It is important that the analyst become well acquainted with the general layout of an input "file". A word of caution: files created in this manner are not necessarily usable with the terminal prompting mode, described in Chapter 5.

The ECONPACK computer program is a very flexible piece of software, containing many optional features for doing EAs. The terminal prompting mode discussed in Chapter 5, while requiring little knowledge of the computer system, offers little freedom in utilizing these options. In the file input mode discussed in this chapter, the user/analyst has freedom to use any of the available options, along with the responsibility to devote more thought to the process.

This chapter is designed to "stand alone". Due to necessity, economic concepts and computer commands are interspersed. For the user's convenience, a command summary is presented on the left side of the page. These summaries provide a quick reference for the commands explained in detail on that particular page.

7.1.1 Sample Input File. The input file consists of several major sections, or "blocks", summarized below:

- Banner/Comments
- Titles/Organization
- Data
- Alternatives
- Output
- Graphics
- Format Reports
- Ranking Sensitivity

A description of these major blocks is presented on the following pages.

NOTE: Input data lines are limited to 72 characters (including quotes and ampersands). Ampersands may be used to indicate continuation of data on the following line. NO BLANK LINES ARE ALLOWED. Either a comma (",") or a space (" ") may be used as a separator/delimiter.



## FILE INPUT MODE

### MAJOR DATA BLOCKS

BLOCK	EXPLANATION
1. Banner/Comments (Optional)	Banners and comments are optional. Any number of banners or comments can be used throughout the input file. The use of an asterisk ("*") in the first column (first character position) is necessary. A banner at the start of the input file can be used to identify the file itself. Comment/banners can be similarly used throughout an input file to insert any information desired for purposes of explaining and/or documenting the various sections of the input file.

#### SAMPLE BANNER/COMMENT

```
*****
*                                     *
*      FORT XYZ PUBLICATION FACILITY  *
*                                     *
*****
```

2. Titles/Organization	This block is a collection of information to be used in labeling reports and as a means of identifying the input files.
------------------------	---

FILE INPUT MODE  
MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
2. Titles/Organization (Continued)	The "TITLES" line can consist of up to five (5) titles (strings), each up to 68 characters long. Titles must be in 'quotes', separated by spaces (each string will appear as a separate line in the printout). Lines of titles in the data input are joined by ampersands (&) at the end of each line. Ampersands must be placed outside of the quotes in order for this continuation feature to work properly. If an ampersand is entered within the quotes as a part of the title itself, then that is how it will be treated. [Quotes cannot be broken at the end of a line using the ampersand.]
A. TITLES [Required; enclose titles in single quotes; use ampersand if more than one line is needed; limited to 5 lines of 68 characters.]	
B. ORGANIZATION [Required; enclose organization title in single quotes; use an ampersand if more than one line is needed; limited to 37 characters.]	The "ORGANIZATION" line can consist of one string of up to 37 characters and must be in single 'quotes'. Include: the organization/command, a point of contact (a telephone number of the submitting contractor's name (if applicable). In the input file, use an ampersand if more than one input line is used. Project information must be in single 'quotes'.
C. DATE [Required; enclose date in single quotes; limited to 37 characters.]	The "DATE" line is the date of submission or date of analysis. Date information must be in single 'quotes', and must not exceed 37 characters.

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
2. Titles/Organization (Continued)	
D. PROJECT [Required; enclose project title in single quotes; use an ampersand if more than one line is needed; limited to 37 characters.]	The "PROJECT" line should describe the title of the project under consideration (max 37 characters). In the input file, use an ampersand if more than one input line is used. Project information must be in single 'quotes'.
E. OBJECTIVE [Required; enclose objective in single quotes; use ampersand if more than one line is needed; limited to 37 characters.]	The "OBJECTIVE" line should specify the project objective (max 37 characters). The objective must be in single 'quotes'. In the input field, use an ampersand if more than one input line is used.

### SAMPLE TITLES/ORGANIZATION BLOCK\*

THE TITLES ARE 'PUBLICATION FACILITY' 'FY92' 'PREPARED JAN 1986' &  
'NATIONAL TRAINING CENTER' 'FORT IRWIN, CALIFORNIA'  
ORGANIZATION &  
'DIRECTORATE OF ENGINEERING AND HOUSING, MR. EDWIN PONO'  
DATE 'JAN 1986'  
PROJECT 'PUBLICATION FACILITY MODERNIZATION'  
OBJECTIVE 'PROVIDE LEAST COST DOCUMENTATION PROCESSING'

\* It is a good idea to include a comment in the input file with  
an asterisk, \*, in column one indicating the price level that the  
analysis is based on. For example, \*Price Level = FY88.

3. Data	The DATA block starts with the "BEGIN DATA" command, and contains a number of subsections. Sample data blocks are shown on page 7-12.
A. BEGIN DATA [Required; starts data block.]	

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
3. Data (Continued)	The last two sets of entries accomplish the same results with and without the ADJUST statements respectively. The order of these commands is important.
B. PERIOD [Required; follow with number of years in the period of analysis.]	The period of analysis is the time, in years, from the beginning of the start year, for which compilations of alternative cost are included. This must be the first command in the DATA block since subsequent commands use this information. The maximum period is 100 years. The period statement consists of the required identifier word PERIOD, followed by the number of years in the period of analysis.
C. START-YEAR [Required; follow with start year.]	The BASE-YEAR and the START-YEAR of the analysis (must be hyphenated). At least one of these two statements must be included in the data block. Both may be included if desired. If only one is included, the other is assumed to be the same. They must follow the PERIOD command.
D. BASE-YEAR [Optional; required only if the base year is different from the start year; if used, follow with base year.]	The BASE-YEAR (optional--assumed to be equal to the START-YEAR if not entered) is the reference point in time for present value calculations. All costs are converted to present value amount as of the beginning of the base year. The BASE-YEAR statement consists of the required identifier phrase BASE-YEAR, followed by the year selected to be the base year.

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
3. Data (Continued)	<p>The START-YEAR is the first year of the period of analysis for which cost data are included. The start year should not be later than the base year. In many cases, the start year will be the same as the base year. If the start year precedes the base year, present value calculations are handled by the program accordingly, so that costs incurred prior to the base year are "discounted forward" or compounded. The START-YEAR statement consists of the required identifier phase, START-YEAR, followed by the year selected to be the start year.</p> <p>The ability to include a base year in addition to the start year allows the user/analyst to specify a point in time, during the period of analysis but other than the beginning of the start year, as the present value reference point.</p> <p>The point in time to which present value calculations convert costs to an equivalent amount is entirely arbitrary. The EA is a tool to support a decision by showing which of a group of mutually exclusive alternatives is the economically best one. The further back in time to which the present worth conversions are made, the smaller will be the final net present value of the costs of the alternatives.</p>

FILE INPUT MODE  
MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
3. Data (Continued)	<p>Specification of a base year which is later than the start year will cause the net present value figures for alternatives to be larger; but determination of the least costly alternative is unaffected by this choice.</p> <p>In an EA, it is the relative differences between alternatives, and the <u>order</u> of preference that is important, not the actual amounts involved. The key to correctly comparing these numbers is that the <u>same</u> point in time be used. ECONPACK guarantees this by automatically applying the same starting point and the same period of analysis to all alternatives.</p> <p>By allowing the user to specify a BASE-YEAR in addition to a START-YEAR, a convention preferred by some analysts is made possible. This convention is to convert all the costs of an alternative to a present value amount as of the beginning of the economic life of the facility.</p> <p>Consider, for example, the case of three alternatives designed to satisfy an objective from FY 1995 through 2004. If one of the alternatives requires a 3-year construction period and the others require only 1 year each, then the period of analysis should be from 1992 through 2004. This allows the costs for the alternative requiring 3 years of "lead" time for construction to be included (for 1992, 1993, and 1994).</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
3. Data (Continued)	All three would provide the function described by the objective, starting in 1995. If BASE-YEAR 1995 and START-YEAR 1992 are entered, then the present value calculations reflect conversion to the beginning of 1995. Without the BASE-YEAR statement, the system defaults to the start year.
E. RATE [Optional; if not used, ECONPACK automatically defaults to 10 percent; if used, follow with the desired rate, expressed as a whole number.]	<p>RATE (optional):</p> <p>The rate statement indicates the discount rate which will be used in the calculations. Current DoD policy for EAs requires that a 10% discount rate and constant dollar analysis be used. If the rate statement is not entered, then the program automatically uses, or defaults to a discount rate of 10%. The RATE statement consists of the required identifier phrase RATE followed by the discount rate, in percent form (e.g., 10% would be entered as 10, not .10). The RATE statement must <u>follow</u> the BASE-YEAR and/or START-YEAR statements.</p> <p>Differential Inflation Data (optional):</p> <p>EAs are done in constant dollars and generally no inflation is included. However, ECONPACK allows for inclusion of tables for the purpose of incorporating recognized differential inflation in the EA. Differential inflation data entered here is used in the program calculations only if the appropriate commands are entered in the alternatives block, discussed later.</p>

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
3. Data (Continued)	Each inflation scenario entry consists of the required identifier phrase INFLATION, a label (maximum 30 characters, including spaces) identifying the inflation scenario (in single 'quotes'), and the estimated inflation (in decimal form)(--e.g., 4% is entered as 0.04 for each year of the period of analysis). Note that a shorthand method of notation may be used: 30*.02 is the same as entering .02 (for 2% per year) thirty times. A maximum of 10 inflation data sets may be included in one ECONPACK run.
F. INFLATION [Optional; use only if a differential inflation rate is expected; if used, follow with a label, 30 characters max--enclosed in single quotes--and the expected differential inflation, expressed in decimal form.]	ADJUST (optional):
G. ADJUST [Optional; if used, must follow the RATE command; if used, follow with the number indicating the sequence of the <u>general</u> inflation scenario.]	The ADJUST statement allows the user/analyst to perform the calculations of an EA in such a way that different inflation scenarios for different cost items can be included in the analysis, with the economy's expected general or overall inflation rate factored out, thus producing a constant dollar analysis that takes into account differential inflation. The ADJUST statement consists of the required identifier term ADJUST followed by a number. The number is the sequence order of that inflation scenario entered in the data block which is meant to represent general inflation.



# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
3. Data (Continued)	<p>If the ADJUST statement is used, then all cost items should be assigned to an inflation scenario, so that the differential inflation calculations will properly reflect the desired assumptions. [Note: Another way of including differential inflation in an ECONPACK EA run, without using the ADJUST statement is to calculate and enter the applicable differential inflation values in the data block.] If used, the ADJUST statement must follow the RATE statement.</p> <p>Residual Value Tables (optional):</p>
H. RESIDUAL [Optional; used if a residual table is desired; if used, follow with a label, 30 characters max--use single quotes--and the residual value for each year of the period of analysis, expressed in decimal form.]	<p>In connection with one of the two general methods of incorporating the concept of residual or salvage value into an EA, residual value tables may be entered at this point in the data block. Residual value data entered here is used in the program calculations only if the appropriate commands are entered in the alternative block. Each residual schedule consists of the required identifier phrase RESIDUAL, a label (maximum 30 characters, including spaces) identifying the residual scenario (in single 'quotes'), and the residual index values. A residual value schedule must contain one residual value for each year of the period of analysis.</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
3. Data (Continued)	The residual value for a given year is equal to that portion (in decimal form) of a specified start value (discussed in this chapter) which is the estimated residual or salvage value at that point during the period of analysis. The same shorthand method used to enter inflation may be used to enter residual values. (e.g., 3*1.0 is the same as entering 1.0 (100%) three times; 1.0 .98 .96 .94 .92 5*.90 means 100% in the first year, 98% in the second, followed by 96%, 94%, and 92% in the succeeding 3 years, 90% for the next five years, etc.) A maximum of 10 residual tables may be included in one ECONPACK run. Sample data blocks are shown on page 7-12.
I. END DATA [Required; ends data block.]	The data block ends with the END DATA command.

-----  
SAMPLE DATA BLOCKS  
-----

I. BEGIN DATA  
THE PERIOD IS 25  
THE START-YEAR IS 1992  
RATE 10  
END DATA

II. BEGIN DATA  
THE PERIOD IS 25  
START-YEAR 1992  
RATE 10  
INFLATION 'CONSTRUCTION' 10\*.02, 15\*.0  
INFLATION 'PERSONNEL' 25\*.01  
INFLATION 'HIGH TECH EQUIPMENT' 10\*-.02, 15\*0  
END DATA

III. BEGIN DATA  
PERIOD IS 25  
START 1992  
ADJUST 2  
INFLATION 'CONSTRUCTION' 25\*.05  
INFLATION 'GENERAL INFLATION' 25\*.04  
INFLATION 'PERSONNEL' 25\*.06  
END DATA

IV. BEGIN DATA  
PERIOD 25  
START 1992  
ADJUST 2  
INFLATION 'CONSTRUCTION' 25\*0.96154  
INFLATION 'PERSONNEL' 25\*1.9231  
END DATA

The inflation scenarios represented in the last two data blocks are identical. The first of these uses the ADJUST statement, in which the inflation scenarios are entered, explicitly delineating estimated inflation for various categories of expense items. The ADJUST statement will cause the program to execute calculations reflecting constant dollar analysis, but recognizing differential inflation by factoring out general inflation as indicated in the second (ADJUST 2) INFLATION schedule entered ('GENERAL INFLATION'). In the last data block, the same results will be generated, but the differential inflation has been calculated by the user in a separate operation.

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives	Each alternative "sub-block" represents an <u>alternative</u> or a scenario of an alternative. Each alternative description starts with "BEGIN ALTERNATIVE" and ends with "END ALTERNATIVE." Two sample alternative blocks for a primary EA and two sample alternative blocks for a secondary EA are presented in this section. A maximum of 20 alternative blocks may be included in one ECONPACK run.
A. BEGIN ALTERNATIVE [Required; begins the alternatives block and each separate alternative.]	
B. END ALTERNATIVE [Required; ends each separate alternative and the alternatives block.]	
	ALTERNATIVE TITLE:
C. ALTERNATIVE TITLE [Required; enclose alternative title in single quotes; limited to 20 characters.]	Describes the alternative (max 20 characters). Appears in the output reports and as legend information on the graph. The alternative name must be included within single 'quotes.'
D. ECONOMIC-LIFE [Required; follow with the economic life of the alternative, enclosed in single quotes.]	ECONOMIC-LIFE (hyphen required) in years (if applicable).  Appears as header information in the output reports. This information item is <u>not</u> used in any calculations. It refers to the economic life of the alternatives.
E. EXPENSE-ITEM [Required; follow with a label, enclosed in single quotes, and a cost for each year in the period of analysis; label can be three lines of 12 characters each; separate lines with a colon.]	EXPENSE-ITEMS (costs):  Each expense item is listed here for the alternative being described in the particular alternative block. Each expense item line consists of the required identifier phrase EXPENSE-ITEM (hyphen required), a label identifying the variable (in single quotes), and the estimated expense for each year of the period of analysis.

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	Expense items are entered in constant dollars (no inflation is included in the costs). Again, note that a shorthand method of notation may be used: 24*100000 is the same as entering 100000 twenty-four times. The label is used for column headings for output tables and cannot exceed 36 characters (12 characters for each line of the label heading, separated by colons--:).
F. SELECT INFLATION [Optional; if used, follow with numbers indicating the appropriate inflation schedule for each expense item.]	SELECT INFLATION (optional):  If differential inflation is to be included in the EA calculations, then this statement is required in the alternative information block, and is entered following the last of the expense-item entries. This statement consists of the required identifier phrase "SELECT INFLATION", followed by an inflation index schedule sequence reference number for each expense item included in the alternative. For example, for an alternative having 4 expense items, the statement, "SELECT INFLATION 1 2 2 3" means that inflation index schedule 1 applies to the first expense item, schedule 2 to the second and third expense items, and schedule 3 to the fourth expense item.

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	Note that the same shorthand method used in other aspects of an ECONPACK input file may be used in this statement: i.e., "SELECT INFLATION 1 2*2 3" is an equivalent command to the one noted on page 7-14. If this statement is not entered at all, the calculations are generated with an assumption of zero inflation for all expense items. If this statement is used, then there must be an inflation schedule referenced for each expense item in the alternative. Entering a zero for the reference number means that a zero inflation scenario will be employed in the calculations. For example, "SELECT INFLATION 1 2*0 3" means that the first inflation scenario entered in the data block applies to the first expense item, zero inflation applies to the second and third expense items, and the third inflation scenario applies to the fourth expense item.
G. SELECT DISCOUNT [Optional; use only if mid-year discounting is not desired; if used, follow with the number indicating the discount factor type for each expense-item.]	SELECT DISCOUNT (optional):  The user can specify with this command which discount factor type applies to each expense item. If this command is not entered, the program will execute calculations based on mid-year discount factors. If this command is entered, then one discount factor type must be entered for each expense item in the alternative (type 1 = beginning of year discount factor, type 2 = mid-year, 3 = end-of-year, 4 = continuous discount factor).

## FILE INPUT MODE

### MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>For example, if there are four expense items, this statement, if entered, would require that four discount factor types be specified. The statement consists of the required identifier phrase "SELECT DISCOUNT," followed by the types. "SELECT DISCOUNT 1 3*2" means the beginning year factor applies to the first expense item in the alternative and the mid-year factor applies to the other three expense items.</p> <p>The discounting conventions selected should reflect the nature of accrual for the respective expense items. For example, if an expense item occurs in lump sum fashion at the end of the year, type 3 (end of year) is appropriate. If it occurs periodically, such as monthly or daily, then type 4 or type 2 (continuous, or mid-year) would be a good choice. If the expense occurs at the beginning of the year, then type 1 would be appropriate.</p> <p>SALVAGE VALUE or RESIDUAL VALUE</p> <p>The concept of salvage value can be incorporated into an ECONPACK EA run in two general ways. Either the value can be determined independently and then entered explicitly as a return, or negative cost, or the user can make use of an automated ECONPACK feature which calculates and displays the entire depreciation schedule according to a particular form.</p>

# FILE INPUT MODE

## MAJOR DATA BLOCKS

(Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	By entering the SALVAGE VALUE statement, the amount entered is assumed to accrue at the end of the last year of the period of analysis. The program converts this amount to a present worth and subtracts the resulting value from the present value of the expense items to arrive at a net present value of the cost of the alternative.
H. SALVAGE VALUE [Optional; if used, follow with the amount of the salvage value.]	<p>The SALVAGE VALUE statement consists of the required identifier phrase SALVAGE VALUE followed by the amount of the salvage value. This amount should be in undiscounted constant dollars, unless some differential inflation is presumed to be applicable. If so, the amount entered should include such differential inflation (i.e., the program will not automatically calculate inflation for the salvage value when using the SALVAGE VALUE statement). If a residual or return of some kind is known to be part of a alternative at some point during the period of analysis other than at the end of the last year (e.g., if the alternative involves the sale of some equipment or its release for some other productive government use), then this effect can be included simply as a cost item with a <u>negative</u> sign.</p> <p>By making use of the RESIDUAL VALUE feature, the salvage value calculations can be included using a preset residual factor schedule.</p>



FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>This feature calculates what the salvage (residual) value would be in each year if the project were to be terminated in that year, and subtracts this amount, in present value terms, from the cumulative present value of the expenses incurred for the alternative through that year. As a result, the analyst is able to see the comparison of alternatives for assumed project termination not only at the end of the period of analysis, but at the end of every year in the period of analysis as well.</p> <p>There are three "sub-options" for calculating depreciation: the straight-line method, the amortization declining balance method, or the user's own method. The user may specify an inflation index to apply to the residual factor, if applicable. A discount factor may also be specified.</p> <p>When doing an EA run which includes salvage or residual values, all alternatives must use the same concept. Either all alternatives having such an occurrence should use the residual value feature, or they should all use the salvage value statement approach. The program will run with a mixture of these two concepts, but the results will be somewhat misleading. The end results to the last year of the period of analysis will be appropriately comparable.</p>

## FILE INPUT MODE

### MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>But for selected years during the period of analysis, a comparison of calculation results is not meaningful, since the residual feature method shows net cumulative present value <u>less</u> discounted termination residual value, whereas the salvage value statement method does not include any subtraction of asset salvage value from cost until the <u>end</u> of the period of analysis.</p> <p>A tabular summary of the required and optional commands for the three different "sub-options" included in the RESIDUAL feature is illustrated in this section.</p> <p>The example shows for each item involved in the RESIDUAL feature the required (or optional) command, the residual type(s) for which it is required, and the applicable parameter characters which follow the command. RESIDUAL feature commands take the general form of "COMMAND" followed by "parameter".</p>

# RESIDUAL SCHEDULE OPTIONS COMMAND SUMMARY

<u>Command</u>	<u>Residual Type for Which Command Is Required*</u>	<u>Parameter</u>
SELECT RESIDUAL START	SL, DB, US	Constant dollar amount of start value, in dollars.
SELECT RESIDUAL TYPE	SL	SL
	DB	DB
	US	Number indicating sequence of residual schedule appearing in data block. If there are three different residual schedules, for example, and the second one is to be used, the parameter would be 2.
SELECT RESIDUAL LIFE	SL, DB	Number of years of residual schedule life.
SELECT RESIDUAL BEGIN	SL, DB	Year residual schedule begins. Residual in this "begin year" is equal to the start value. Residual factors indicating decline in residual value (depreciation) take effect in year following this "begin" year.
* SL = straight line		
DB = declining balance		
US = user specified		

RESIDUAL SCHEDULE OPTIONS COMMAND SUMMARY  
(Continued)

<u>Command</u>	<u>Residual Type for Which Command Is Required</u>	<u>Parameter</u>
SELECT RESIDUAL RATE	DB (optional)	The interest rate, in percent, upon which the amortization schedule used to derive the declining balance residual schedule is based.
SELECT RESIDUAL RATE (Continued)	DB (optional)	If this command is not entered and a DB residual type is being used, then the rate specified with the RATE command in the data block will be used. If no RATE statement is entered in the data block, the rate used for the DB residual will be the default rate, which is 10%.
SELECT RESIDUAL INFLATION	SL,DB,US (optional)	Number indicating sequence of inflation schedule user wishes to apply to residual value.

RESIDUAL SCHEDULE OPTIONS COMMAND SUMMARY  
(Continued)

<u>Command</u>	<u>Residual Type for Which Command Is Required</u>	<u>Parameter</u>
SELECT RESIDUAL INFLATION (Continued)	DB (optional)	If this statement is not entered, the program will execute calculations assuming a zero rate of inflation for the residual.
SELECT RESIDUAL DISCOUNT	SL,DB,US (optional)	1 = beginning of year discount factor. 2 = mid-year discount factor. 3=end of year discount factor. 4 = continuous discount factor.  If this statement is not entered, program will execute residual calculations based on end-of-year discount factors.

## FILE INPUT MODE

### MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>Format Report Statements (optional):</p> <p>These statements must be included in the alternatives block if the specialized report formats, discussed in Chapter 1 are to be generated in the ECONPACK program run. For the format reports A-1 (primary analysis), and A (secondary analysis), each expense item for an alternative must be identified by category. This identification is accomplished with the use of format report statements.</p> <p>These statements take the familiar form of "COMMAND," followed by a number indicating the sequence order of the expense item to which the command refers. For example, the statement, "NEW COSTS 1 2" means that the first and second expense items in the alternative block are to be lumped together into the NEW investment category for purposes of the A-1 report format. A shorthand notation may be employed in these statements, using the hyphen (i.e., 1-4 refers to expense items 1 through 4 and is equivalent to 1 2 3 4.</p> <p>The FORMAT REPORT STATEMENTS SUMMARY included in this chapter summarizes the format statement commands according to category of alternative. There are three such categories: an alternative can be either a secondary EA alternative, a status quo alternative for a primary EA, or a proposed alternative for a primary EA.</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>A review of the summary shows that for a secondary analysis, if a special format report is to be generated, then every expense item in the alternative must be identified as either an R&amp;D, an investment, or a recurring annual expense. A similar requirement exists for each of the other two categories of alternatives.</p> <p>Explanations for these format report statements are provided later. For either of the format reports, the computer program adds together, for each year in the period of analysis, all of the expense items for each category as identified by these report format statements.</p> <p>In the case of secondary analysis, sums for the three categories are printed out in the Format A report, left to right. Then the sum and the discounted sum are printed out for each year in the period of analysis. These discounted annual amounts are then summed to show the cumulative present value of all costs, excluding any salvage/residual value which may be involved for the entire period of analysis. The uniform annual equivalent of this amount is then shown, followed by the same figures adjusted by subtracting the applicable salvage/residual value.</p> <p>In the case of primary analysis, a similar process takes place. Primary analysis looks at the EA in a slightly different way, as reflected by the A-1 format.</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>The issue addressed in a primary EA is whether a proposed alternative to the status quo will result in savings sufficient to offset any costs required to implement such a change.</p> <p>The A-1 format shows the subtraction of the sum of the recurring costs for the proposed alternative from the recurring costs for the existing situation. This difference is shown for each year, is discounted, and these discounted annual amounts are summed to arrive at a total present value of "savings" resulting from the proposed change. Then, in a step-by-step summary, the net cost of implementing the change required to generate the savings is shown. First, the present value of all costs identified as new investment costs is shown. Added to this is the present value of any existing assets to be used in implementing the proposed new alternative. Then, the present value of any items released for other use (replaced assets) is subtracted, as is the present value of the salvage/residual value of the new alternative. This results in a "net cost" of the new proposal.</p> <p>Then the present value of the savings (outlined in the first part of the A-1 format) is entered. The present value of any refurbishment type costs that would have been required with a continuation of the status quo, is added to it.</p>



# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	<p>Since in the absence of the status quo alternative there would be no status quo alternative salvage value, the present value of that amount is subtracted to result in a "net" present value of savings associated with the proposed alternative. With the investment and savings thus calculated, their ratio (the SIR) is derived and printed, as is the discounted payback period.</p> <p>The user will recall that for a secondary analysis, if a special format report is to be generated, then every expense item in the alternative must be classified as either an R&amp;D, investment, or recurring expense. The format statement commands below are used for this task.</p>
I. INVESTMENT [Optional; if used, follow with numbers of expense items which are investment costs.]	<p>INVESTMENT (secondary):</p> <p>This identifies an expense item generally as a one-time cost associated with an activity which is of a non-recurring nature. An investment cost may take place over more than one year, even though it tends to be non-recurring on a regular basis.</p>
J. R&D [Optional; if used, follow with numbers of expense items that are R&D costs.]	<p>R&amp;D (secondary):</p> <p>This identifies an expense item as a research and development item, which may be necessary for project implementation. R&amp;D expense items tend to be of a non-regularly-recurring nature.</p>

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
K. RECURRING [Optional; if used, follow with numbers of expense items that are recurring costs.]	RECURRING (secondary or primary).  This identifies an expense item as a recurring cost (usually annually) required to continue execution of the project or program alternative.
L. REFURBISHMENT [Optional; if used, follow with numbers of expense items that are refurbishment costs.]	REFURBISHMENT (status quo primary):  This identifies an expense item as a one-time cost (although it may take place over more than one year) for modification, modernization, etc., required for continued operation of the alternative.
M. NEW [Optional; if used, follow with numbers of expense items that are new costs.]	NEW (proposed primary):  This identifies an expense item as a new investment cost required for implementation of the proposed alternative being considered in a primary analysis.
N. INHERITED [Optional; if used, follow with numbers of expense items that are inherited assets.]	INHERITED (proposed primary):  This identifies an expense item as an inherited asset, which is an existing asset to be used as a part of the proposed alternative. An inherited asset cost is similar in concept to a one-time investment type cost. It is distinguished from other costs, though, in that no cash flow is associated with the item, while it still represents an expense in an indirect way.

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
4. Alternatives (Continued)	If a proposed alternative will make use of some asset (e.g., land, structure, equipment) which already exists, and therefore does not require acquisition, then this use constitutes an inherited asset cost if the asset would have otherwise been used for some other productive government activity. The cost of acquiring a comparable asset is the basis for the amount of the inherited asset cost.
0. REPLACED [Optional; if used, follow with numbers of expense items that are replaced assets; enter as a negative number.]	REPLACED (proposed primary):  This identifies an expense item as an asset that is replaced as a part of the proposed alternative. It reflects a need that no longer exists. Because of the proposed alternative, it is "freed" for some other productive government use or use elsewhere in the economy (by being sold). An expense item that is a REPLACED ASSET item <u>must be entered as a negative cost</u> , since the expense item describes a return to the government.
NOTE: [See attached FORMAT REPORT STATEMENTS SUMMARY.]	

# FORMAT REPORT STATEMENTS SUMMARY

## Command by Analysis Type

<u>Secondary Analysis*</u>	<u>Primary Analysis</u>	
	<u>Status Quo</u>	<u>Proposed</u>
INVESTMENT	RECURRING	RECURRING
R&D	REFURBISHMENT	NEW
RECURRING		INHERITED
		REPLACED

\*It is not necessary that all of these commands be used for an alternative in a secondary analysis. For example, if there is no R&D expense associated with an alternative, then naturally, there would be no R&D command. But, every expense item in the alternative must be identified by one (only one) of these three commands if a Format A report is to be generated in the ECONPACK run, i.e., each expense item in the alternative would have to be identified as either an investment, an R&D, or a recurring cost item. Similarly, every expense item in a status quo Primary EA alternative must be identified as either recurring, refurbishment cost, etc.

SAMPLE ALTERNATIVE BLOCKS, PRIMARY EA

- I. BEGIN ALTERNATIVE  
ALTERNATIVE TITLE 'CONTINUED USE OF OFFSET PRINTING METHODS'  
ALTERNATIVE NAME 'OFFSET PRINT SHOP'  
EXPENSE-ITEM-1 'PERSONNEL' 25\*500000  
EXPENSE-ITEM-2 'MAINTENANCE' 25\*150000  
EXPENSE-ITEM-3 'SUPPLIES' 25\*200000  
EXPENSE-ITEM-4 'MAJOR:OVERHAUL' 4\*0 100000 4\*0 100000 4\*0 &  
100000 4\*0 100000 5\*0  
ECONOMIC-LIFE IS '25 YEARS'  
RECURRING COSTS ARE 1-3  
REFURBISHMENT COST IS 4  
SALVAGE IS 10000  
END ALTERNATIVE
- II. BEGIN ALTERNATIVE  
ALTERNATIVE TITLE IS 'COMPUTER/LASER TECHNOLOGY BASED' &  
'REPRO--SYSTEM #1'  
ALTERNATIVE NAME 'COMPUTER REPRO #1'  
EXPENSE-ITEM-1 'EQUIPMENT:COST' 200000 6\*0 50000 17\*0  
EXPENSE-ITEM-2 'PERSONNEL:TRAINING' 50000 24\*0  
EXPENSE-ITEM-3 'HIGH SPEED:PUNCH' 5000 24\*0  
EXPENSE-ITEM-4 'OLD:EQUIPMENT:SALE' - 10000 24\*0  
EXPENSE-ITEM-5 'MAINTENANCE' 150000 24\*20000  
EXPENSE-ITEM-6 'SITE PREP:8:INSTALLATION' 15000 24\*0  
EXPENSE-ITEM-7 'MAJOR:OVERHAUL' 11\*0 50000 13\*0  
EXPENSE-ITEM-8 'SUPPLIES' 200000 24\*100000  
EXPENSE-ITEM-9 'PERSONNEL' 500000 24\*200000  
ECONOMIC-LIFE '25 YEARS'  
RECURRING COSTS ARE 5 8 9  
NEW COSTS ARE 1 2 6 7  
INHERITED ASSET IS 3  
REPLACED ASSET IS 4  
SALVAGE VALUE IS 20000  
END ALTERNATIVE

SAMPLE ALTERNATIVE BLOCKS, SECONDARY EA

- I. BEGIN ALTERNATIVE  
ALTERNATIVE TITLE 'NEW CONSTRUCTION'  
ALTERNATIVE NAME 'MILITARY CONSTRUCTION'  
EXPENSE-ITEM-1 'CONSTRUCTION:COST' 4\*10000000 21\*0  
EXPENSE-ITEM-2 'MAINT:&:REPAIR' 0 250000 500000 &  
750000 21\*1000000  
EXPENSE-ITEM-3 'UTILITIES' 0 200000 400000 600000 &  
21\*800000  
EXPENSE-ITEM-4 'SERVICES' 0 50000 100000 150000 21\*200000  
EXPENSE-ITEM-5 'ADMIN' 0 100000 200000 300000 21\*200000  
EXPENSE-ITEM-6 'ALLOWANCES' 3000000 2250000 1500000 750000 &  
26\*0  
EXPENSE-ITEM-7 'DEMOLITION' 1500000 29\*0  
ECONOMIC-LIFE '30 YEARS'  
SELECT INFLATION 1 3\*3 2\*2 1  
SELECT DISCOUNT 2 5\*4 2  
SELECT RESIDUAL START 40000000  
SELECT RESIDUAL TYPE DB  
SELECT RESIDUAL LIFE 30  
SELECT RESIDUAL BEGIN 1994  
SELECT RESIDUAL RATE 8  
SELECT RESIDUAL INFLATION 3  
INVESTMENT 1  
RECURRING 2-5  
END ALTERNATIVE
- II. BEGIN ALTERNATIVE  
ALTERNATIVE TITLE 'ECONOMY HOUSING, PAYMENT OF ALLOWANCES'  
ALTERNATIVE NAME 'ECONOMY HOUSING'  
EXPENSE-ITEM-1 'PROPERTY:DISPOSAL:EXSTG UNITS' -3000000 &  
24\*0  
EXPENSE-ITEM-2 'PAYMENT:OF:ALLOWANCES' 25\*3000000  
EXPENSE-ITEM-3 'ADMIN' 25\*300000  
ECONOMIC-LIFE 'NA'  
SELECT INFLATION 1 2\*3  
SELECT DISCOUNT 1 2\*4  
INVESTMENT 1  
RECURRING 2-3  
END ALTERNATIVE

FILE INPUT MODE

MAJOR DATA BLOCKS

(Continued)

BLOCK	EXPLANATION
5. Output (Optional)	The output block begins with "BEGIN OUTPUT." By using the output block commands, any or all of three different output reports can be generated (excluding the special formats A, A-1 and B, and graphics, which are handled in another part of the input file). These are called the summary report, the by-year report, and the by-item report.
A. BEGIN OUTPUT [Required if output block is used.]	
B. SUMMARY REPORT [Optional; use if summary report should be printed.]	The SUMMARY REPORT shows, for each year in the period of analysis, the cumulative present value of costs less the residual present value (if the automated residual feature is not used, the cumulative present value alone is included for each year, except that in the last year the salvage present value is subtracted (if a salvage value statement has been entered).
C. BY-YEAR REPORT [Optional; use if by-year report should be printed.]	In the BY-YEAR REPORT, the amount of each expense-item is displayed by year, showing totals, discounted amounts, cumulative discounted amounts, discounted residual/salvage value amounts, and net cumulative discounted amounts (i.e., net of residual/salvage value). Also shown in the by-year report is the uniform annual equivalent amount (based on the end-of-year convention) of the total cumulative net present value of the cost of the alternative.

FILE INPUT MODE  
MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
5. Output (Optional) (Continued)	This annual equivalent is based on the period starting with the beginning of the base year (or start year, if no base year has been specified), and ending at the end of the period of analysis as indicated with the period statement in the data block. For example, with PERIOD 30, START 1990, and BASE 1995, the uniform annual equivalent will be based on 25 years. Without the BASE 1995 statement, the annual equivalent will be based on 30 years. On the by-year report, these categories are displayed from left to right as column headings, while the years are lined up at the left side of the row titles.
D. BY-ITEM REPORT [Optional; use if by-item report should be printed.]	In the BY-ITEM REPORT, the reverse is true. Each column in this report shows a summary of the derivation of the cumulative present value of alternative costs for each year in the period of analysis. This by-item report is seldom used but can provide insight to the analyst who wants to view the relationship between the various numbers involved from a different perspective. A sample output block is shown on page 7-34.



FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
E. END OUTPUT [Required if output block is used.]	The summary and by-year reports are the recommended formats for presentation, while the by-item report is an alternative format. All of the output block commands are optional, as is the output block itself. If the output block is not entered, the summary report and the by-year report are automatically generated. The output block ends with "END OUTPUT".

SAMPLE OUTPUT BLOCK

```
BEGIN OUTPUT
SUMMARY REPORT
BY-YEAR REPORT
BY-ITEM REPORT
END OUTPUT
```

## FILE INPUT MODE

### MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
6. Graphics (Optional)	The graphics block begins with "BEGIN GRAPHICS" and ends with "END GRAPHICS". A simple line plot of up to six alternatives can be created by utilizing the graphics block. There are no graphs produced if the block is not included in the input file. For users with Tektronix compatible terminals, running ECONPACK on the Corps' Harris Computer System supporting Extended Easy Graphing (CEEG), a higher quality graph may be plotted on their screens.
A. BEGIN GRAPHICS [Required if graphics block is used.]	
B. END GRAPHICS [Required if graphics block is used.]	

Most of the graphics block commands are optional. Leaving them out results in default values automatically being printed out in the graph output. The only command which is actually required is the Plot Alternatives commands, discussed along with the other commands in the following paragraphs. Two sample graphics blocks are presented at the end of the section.

The data which is graphed is the net cumulative present value of the alternative in millions of dollars. This is the output in the summary report, i.e., if the automated residual value feature is used, then the graph reflects net cumulative present value of costs less project termination residual present value. Otherwise, it represents net cumulative present value of costs. In the case of the former situation, the graph will represent a relatively smooth curve.

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
6. Graphics (Optional) (Continued)	In the case of the latter situation, the drop will usually be small for the last year of the period of analysis, if the salvage value statement was included. Since the data is plotted in millions, it may not be appropriate to include the graphics option for the numbers which are in orders of magnitude significantly less than millions.
C. PLOT ALTERNATIVES [Required; follow with numbers indicating alternatives to be plotted.]	PLOT ALTERNATIVES (required)  Up to six alternatives per graph may be identified by name or number. The number is the sequence number of the alternative. For example, PLOT ALTERNATIVES 1-3 will result in a graph of the first, second, and third alternatives. Note that the same shorthand method used in other examples also applies here, i.e., 1-3 means 1 through 3. The sequence number refers to the order in which the alternative information describing each of the alternatives appears in the input file.
D. PLOT TITLES [Optional; if used, follow with titles, enclosed in single quotes; limited to 72 characters.]	PLOT TITLES (optional):  Up to two titles of 72 characters each may be used to identify the particular graph. If no titles are entered, one line of title information appears on the graph: "NET CUMULATIVE PRESENT VALUE."

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
6. Graphics (Optional) (Continued)	A suggested second line, if the automated residual value feature is used in the run, is "LESS PROJECT TERMINATION RESIDUAL VALUE." Otherwise, the default single title line which already appears is sufficient.
E. XLABEL [Optional; may be used to relabel horizontal axis; if used, enclose label in single quotes.]	XLABEL (optional==labeling the horizontal axis): if nothing is entered, FISCAL YEAR appears.
F. YLABEL [Optional; may be used to relabel the vertical axis; if used, enclose label in single quotes.]	YLABEL (optional--labeling the vertical axis): if nothing is entered, MILLIONS OF DOLLARS will appear.
G. XRANGE [Optional; may be used to reset the horizontal axis.]	For clarity, the graph's ranges may be re-set using "XRANGE" and "YRANGE" (optional).
H. YRANGE [Optional; may be used to reset the vertical axis.]	
I. LEGEND [Optional; may be used to rename legend; if used enclose legend title in single quotes; limited to 20 characters.]	LEGEND (optional): This command creates a legend for each alternative plotted--in order selected. Legend titles may not exceed 20 characters. Otherwise, the ALTERNATIVE NAME appears as the legend descriptor label.

---

SAMPLE GRAPHICS BLOCKS\*

---

I. BEGIN GRAPHICS

PLOT TITLES ARE 'GRAPHICAL DISPLAY OF RESULTS' &  
'NET CUMULATIVE PRESENT VALUES'  
PLOT ALTERNATIVES 1, 2, 3  
XLABEL IS 'FISCAL YEAR'  
YLABEL IS 'MILLIONS OF DOLLARS'  
LEGEND 'RENOVATION'  
LEGEND 'NEW CONSTRUCTION'  
LEGEND 'HOUSING ALLOWANCE'

END GRAPHICS

II. BEGIN GRAPHICS

PLOT ALTERNATIVES 1-3

END GRAPHICS

\*Both sample graphics blocks will result in a graph of the data  
for alternatives 1, 2, and 3.

---

FILE INPUT MODE  
MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
7. Format Reports (Optional)	If a format report is to be generated as a part of an ECONPACK run, then a format block is required to be included in the input file. All format blocks begin with the statement, BEGIN FORMAT, and end with the statement, END FORMAT.
A. BEGIN FORMAT [Required to begin format block.]	
B. END FORMAT [Required to end format block.]	

A format block can generate special reports for secondary analysis or a primary analysis. For a secondary analysis, the format block must contain commands required for producing report Format A. It may also, optionally, contain commands for generating report Format B for project benefits. For a primary analysis, the format block must contain commands required for producing Format A-1. As with secondary analysis, the primary analysis Format A-1 may be accompanied, at the user's option, by a Format B report, which requires certain commands to be included in the input file format block.

The information which appears in the Format A or A-1 report (and optional B report if applicable) is generated by the computer program. The program uses the format block commands discussed below in combination with format statements entered in the applicable alternative block. Other information regarding organization, objective, etc., also appears in these format reports and is taken from the appropriate part of the input file.

The format block commands are summarized and explained on pages 7-40 through 7-42.

# FORMAT BLOCK COMMAND SUMMARY

<u>Command</u>	<u>Format Report Type</u>	<u>Explanation</u>
SECONDARY ANALYSIS	A	This statement, followed by the alternative number, indicates which alternative will be covered by the Format A report. One Format A report covers one alternative number. Therefore, only one alternative number is to follow this statement. The example SECONDARY ANALYSIS 2, means that this format report will be for alternative 2.
PRIMARY ANALYSIS	A-1	This statement must be entered to identify the format block as being for a primary analysis. Nothing more than these two words is required to be entered.
PRESENT	A-1	This statement must be entered to identify which alternative is the status quo alternative involved in the analysis. It is followed by a number. The number tells which alternative, by sequence order in the input file, is the status quo alternative. For example, "PRESENT IS 3" means that the alternative described in the third alternative block in the input file is the status quo alternative.
PROPOSED	A-1	This statement must be entered to indicate which alternative is the proposed change to be analyzed.

FORMAT BLOCK COMMAND SUMMARY  
(Continued)

<u>Command</u>	<u>Format Report Type</u>	<u>Explanation</u>
PROPOSED (Continued)	A-1	For example, "PROPOSED IS 4" means that the proposed alternative is the one covered in the fourth alternative block.
ACTION OFFICER	A, A-1	This statement, followed by the name and title in single 'quotes' of the individual who is the action officer, will cause this information to be printed in the appropriate space in the format reports (maximum of 40 characters, including blank spaces).
SOURCE COSTS	A, A-1	This statement must be entered if the format report includes any text for the paragraph covering "Source/ Derivation of Cost Estimates". The SOURCE COSTS statement must be entered alone on one line, followed by lines of text derived by the user/analyst. After the last line of such text, the statement \$\$\$ must be entered alone on the next line of the input file.
BENEFITS SECTION	B	This statement must be entered if Format B is to be included as a part of the format report output. This statement must be entered alone on one line, followed by lines of text as desired by the user/analyst. These lines of text will appear in the Format B report in the section indicated as "Benefits."



FORMAT BLOCK COMMAND SUMMARY  
(Continued)

<u>Command</u>	<u>Format Report Type</u>	<u>Explanation</u>
BENEFITS SECTION	B	After the last line of this text, the statement \$\$\$ must be entered alone on the next line of the input line.
SOURCE BENEFIT	B	This statement works exactly as the SOURCE COSTS and BENEFITS SECTION commands explained above. Applicable lines of text appear in the Format B report in the section indicated as "Source/ Derivation of Benefits." The \$\$\$ command applies in the same way as with these other text commands.
\$\$\$	A,A-1,B	This string of three dollars signs must follow the last line of text included after the SOURCE COSTS, BENEFITS SECTION, or SOURCE BENEFITS statements as discussed above. The \$\$\$ statement must be entered alone on one line.

-----  
SAMPLE FORMAT BLOCKS\*  
-----

I. BEGIN FORMAT  
    SECONDARY 1  
    ACTION OFFICER 'EDWIN PONO, ENGINEERING'  
    SOURCE COSTS  
    COSTS ARE BASED ON ESTIMATES  
    PROVIDED BY FACILITY ENGINEER  
    \$\$\$  
END FORMAT

II. BEGIN FORMAT  
    PRIMARY ANALYSIS  
    ACTION OFFICER 'EDWIN PONO, ENGINEERING'  
    PRIMARY 1  
    PROPOSED 2  
    SOURCE COSTS  
    COSTS ARE BASED ON ESTIMATES FROM  
    ENGINEERING CONTRACTOR  
    \$\$\$  
    BENEFITS  
    SAVINGS IN TIME AND EXPENSE WILL RESULT  
    \$\$\$  
END FORMAT

\*The first format block is for a Format A report (secondary analysis). It will produce such a report for the first alternative in the input file. If no text for the "Source/Derivation" of costs paragraph had been provided, there would be no such output included. The second format block will result in a Format A-1 report (primary analysis) comparing a proposed change (alternative 2) to the status quo (alternative 1). A Format B report will be generated only for the second (A-1) format block.

## FILE INPUT MODE

### MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity	<p>ECONPACK has a sensitivity analysis module. The automated sensitivity analysis routine of this program allows the analyst to systematically determine the extent to which changes in specified input values produce changes in conclusions. The analyst can direct the program to determine the percentage change (up or down), in a particular expense element or group of expense elements, required to alter the rankings of the alternatives.</p> <p>Consider, for example, an EA calculation which shows that each of two proposed alternatives is less costly than the status quo alternative. Sensitivity analysis routines can be set up to determine how much larger one or more cost items in the proposed alternatives would have to be for the status quo alternative to be least costly. Similarly, sensitivity routines could be set up to determine how much of a reduction in one or more cost items comprising the existing alternative would be required to make it the least cost.</p> <p>The sensitivity analysis routine will determine for any group of selected cost items in one or more alternatives, for any selected number of alternatives, the percent change required to result in a least cost ranking other than the initial least cost ranking. Such "what if" calculation scenarios are potentially complex, but the usual case, as noted above, is relatively simple.</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity (Continued)	<p>Choosing items to include in sensitivity tests should be based on common sense. For example, estimates of some expense items may have been made with less certainty than others. Data sources may be weak or vague, or the estimate may involve future projections which are especially clouded with uncertainty. Such items deserve to be tested for sensitivity.</p> <p>The examples in the Sample Sensitivity Analysis Blocks involve the kind of scenario discussed above. Alternative 1 is the status quo, and alternatives 2 and 3 are proposed changes, both involving the purchase of new equipment, and a different (and lower) set of annually recurring costs. In the initial ranking, both 2 and 3 were less costly than 1. The two sensitivity blocks are set up to determine how much more expensive the new equipment would have to be or how much more the recurring annual cost would have to be, respectively, for the new alternatives to be more costly than the status quo. If the results show that relatively small changes can produce a switch in the ranking, further investigation is warranted. If, on the other hand, major changes would have to take place to change the EA ranking results, then further work would not be productive, and there can be a greater degree of confidence in the initial results.</p>

# FILE INPUT MODE

## MAJOR DATA BLOCKS (Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity (Continued)	Sensitivity analysis is more than a single test on the least cost alternative. Rather, it is made up of a series of tests that will provide the analyst with "ranges" for critical and/or highly sensitive expense items. The analyst (and decision-maker) can then express a degree of confidence in the results obtained. Any of these "sensitivity analysis blocks" can appear with the input file, each beginning with "BEGIN RANKING SENSITIVITY" and ending with "END RANKING SENSITIVITY." However, sensitivity analysis blocks must be the last part of an input file. All other parts of the input file <u>must</u> appear before the sensitivity blocks.
A. BEGIN RANKING SENSITIVITY [Required to start ranking sensitivity block.]	
B. END RANKING SENSITIVITY [Required to end ranking sensitivity block.]	
	The statements which are included in a sensitivity block are explained in the following paragraphs:
C. RUN TITLE [Required; follow with a title, enclosed in single quotes; limited to 70 characters.]	RUN TITLE:  This statement is used to describe the sensitivity test to be performed. The run title can be up to 70 characters long. The statement consists of the phrase RUN TITLE, followed by the title in single 'quotes'.
D. SELECT ALTERNATIVES [Required; follow by the numbers of alternatives to be included.]	SELECT ALTERNATIVES:  This statement is used to identify which alternatives are to be involved in the sensitivity analysis routine. It consists of the required statement, SELECT ALTERNATIVES, followed by the numbers of the alternatives included in the analysis of sensitivity.

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity (Continued)	<p>For example, SELECT ALTERNATIVES 1-3 5, means that the analysis covers the first three, and the fifth, alternatives in the input file. Alternative 4 in this example is excluded from the sensitivity test. A reason for doing this could be that while alternative 4 is perhaps clearly the least cost alternative, a strong possibility may exist that the decision making authority may disfavor alternative 4 for non-economic reasons. In such a case, the EA can anticipate this possibility by establishing greater confidence regarding the rank order of the remaining alternatives.</p> <p>The alternative name may be used in place of the alternative number in identifying which alternatives are included in the sensitivity analysis. If this is done, the exact name must be used, as it appears in single quotes in the alternative block. If short, cryptic names have been used, this is a relatively easy way to select alternatives for a sensitivity test, with the added advantage that the input file becomes more self-documenting and more meaningful.</p>
E. CHANGE [Required; follow with numbers, indicating the alternative and the expense items within that alternative to be changed.]	<p>CHANGE:</p> <p>The change command is used to select which expense elements are to be changed for the sensitivity test. The first number following CHANGE indicates the alternative and the succeeding numbers indicate the expense elements within the alternative.</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity (Continued)	<p>CHANGE: (Continued)</p> <p>For example, CHANGE 1,1,2 means that expense item one and two in the first alternative are to be changed in the sensitivity test. If, in the same sensitivity test, items 3,4,5, and 6 in alternative three were also to be changed, the following two statements would suffice:</p> <p>CHANGE 1 1 2 CHANGE 3 3-6</p> <p>(NOTE: The second change command could have been written CHANGE 3 3 4 5 6, but the shorthand notation using the hyphen was used.)</p> <p><u>AVOID</u> including expense items which include negative numbers in an ECONPACK sensitivity analysis module. Unusual calculation sequence and comparison logic may follow, which can be misleading. The use of negative numbers in an EA expense item is a special case consideration. Sensitivity analysis regarding such expense items is most safely and clearly accomplished if done separately from the automated ECONPACK sensitivity analysis module.</p>
F. LIMIT [Optional; used to alter the upper limit for the sensitivity analysis.]	<p>LIMIT:</p> <p>This command sets the maximum positive change for the sensitivity test. For example, LIMIT 100 means that the expense elements involved in the sensitivity test (per the CHANGE command) are to be changed no more than +100% (twice the initial value).</p>

FILE INPUT MODE

MAJOR DATA BLOCKS  
(Continued)

BLOCK	EXPLANATION
8. Ranking Sensitivity (Continued)	LIMIT: (Continued)  If no limit is set, the maximum positive change is assumed to be +200% (i.e., a tripling of the initial value). The maximum negative change is automatically set -100% (reduction to zero).
G. RANK [Required; follow with the alternative number to be ranked at least cost.]	RANK:  The rank command selects the alternative which the analyst wishes to be ranked at least cost in the sensitivity test. For example, RANK 2 indicates that the computer program will check to see how much of a change in the indicated expense items will be required to result in the second alternative being least cost among those alternatives selected in the sensitivity analysis block. Rank 3 would cause the same exercise to occur for the third alternative, etc.
H. TIME [Optional; if used, follow with the number of years for which the sensitivity tests are to be performed.]	TIME:  The TIME command selects the number of years, from the beginning of the period of analysis, for which the sensitivity tests are to be performed. For example, if the period of analysis is 25, and TIME 15 is entered, then the change testing will be performed only for the first 15 years in the period of analysis. If this statement is not entered, the program execution performs sensitivity test calculations for the entire period of analysis. (NOTE: This statement is rarely used.)



-----  
SAMPLE SENSITIVITY ANALYSIS BLOCKS  
-----

- I. BEGIN RANKING SENSITIVITY  
RUN TITLE 'CH IN NEW EQPMT TO MAKE EXISTING PROJECT LST' &  
'COSTLY'  
SELECT ALTERNATIVES 1,2,3  
CHANGE 2 1 7  
CHANGE 3 2, 5  
LIMIT 500  
RANK 1  
END RANKING SENSITIVITY
- II. BEGIN RANKING SENSITIVITY  
RUN TITLE 'CHANGE IN MNTNCE, SUPPLIES, & PERSONNEL TO MAKE' &  
'STATUS QUO LST CST'  
SELECT ALTERNATIVES 1-3  
CHANGE 2 4,7  
CHANGE 3 5,8,9  
LIMIT 500  
RANK 1  
END RANKING SENSITIVITY

#### NOTES:

Stop Run. The last statement in an ECONPACK input file is the STOP RUN statement. It is entered, alone, on the last line of the input file. It is mandatory that it be included.

#### 7.1.2 Creating and Executing a File Using the File Input Mode

Specific instructions for creating and executing a file using the file input mode are given in this section. Briefly, the user must perform the following tasks:

- TASK 1: Log on to ECONPACK.
- TASK 2: Enter the CMS environment.
- TASK 3: Enter the edit mode of the CMS environment.
- TASK 4: Enter the input mode of CMS environment.
- TASK 5: Create an input file.
- TASK 6: Reenter the edit mode of the CMS environment.
- TASK 7: Save the input file created in TASK 5.
- TASK 8: Return to the MAIN ECONPACK MENU.
- TASK 9: Check the manual input file for errors.
- TASK 10: Execute ECONPACK.
- TASK 11: Select desired ECONPACK reports.
- TASK 12: Return to MAIN ECONPACK MENU.
- TASK 13: Return to PAX System.
- TASK 14: Log off the system.

Detailed instructions for these tasks are presented in this section.

### 7.1.2 Creating and Executing a File Using the File Input Mode

---

#### COMPUTER/USER INTERACTION

#### EXPLANATION

---

TASK 1: LOG ON TO ECONPACK USING PROCEDURE 3.7.1.

---

##### PAX SYSTEM MENU

- |                         |                            |
|-------------------------|----------------------------|
| 1. ECONPACK             | System transfers user from |
| 2. PAXMAIL              | PAX System to ECONPACK.    |
| 3. DD1391 PROCESSOR     |                            |
| 4. PRINT PAX NEWSLETTER |                            |
| 5. CHANGE PASSWORD      |                            |

PAX>1 (CR)

---

TASK 2: ENTER THE CMS ENVIRONMENT.

---

##### \*\*\* MAIN ECONPACK MENU \*\*\*

1. CREATE AN INPUT FILE
2. ADD TO OR CHANGE AN EXISTING  
INPUT FILE
3. EXECUTE ECONPACK
4. PRINT ECONOMIC ANALYSIS  
REPORTS
5. CHECK MANUAL INPUT FILE  
FOR ERRORS
6. HELP FACILITY
7. CMS
8. RETURN TO PAX MENU

User is transferred  
to CMS where a file  
can be created/changed  
without the use of the  
terminal prompting  
sequence.

ENTER DESIRED OPTION>7 (CR)

---

TASK 3: ENTER THE EDIT MODE OF THE CMS ENVIRONMENT.

---

User enters the CMS  
editing environment to  
create a new file or  
edit an existing file.

C>EDIT [filename filetype] (CR)

7.1.2 Creating and Executing a File Using the File Input Mode  
(Continued)

COMPUTER/USER INTERACTION	EXPLANATION
TASK 4: ENTER THE INPUT MODE OF THE CMS ENVIRONMENT.	
NEW FILE: E> <u>I</u> (CR)	System transfers user to input mode and gives an I>. Only text editing commands may be entered at an E>.
TASK 5: CREATE AN INPUT FILE AS DESCRIBED IN CHAPTER 7.	
I> _____ (CR) . . . I> _____ (CR)	User creates desired file. Data entered after an I> will be taken as text.
TASK 6: REENTER THE EDIT MODE.	
I> <u>(CR)</u>	A (CR) entered at an I> returns user to the edit mode.
TASK 7: SAVE THE FILE JUST CREATED.	
E> <u>FILE</u> (CR)	Causes the temporary file to become a permanent file on the user's ECONPACK permanent disk, and returns the user to a C>.
TASK 8: RETURN TO MAIN ECONPACK MENU.	
C> <u>ECON</u> (CR)	System transfers user from CMS to the ECONPACK System.

7.1.2 Creating and Executing a File Using the File Input Mode  
(Continued)

---

COMPUTER/USER INTERACTION	EXPLANATION
---------------------------	-------------

---

TASK 9: CHECK THE MANUAL INPUT FILE FOR ERRORS.

---

\*\*\*\*\* MAIN ECONPACK MENU\*\*\*\*\*

- |  |   |
|--|---|
| 1. CREATE AN INPUT FILE                    | System prints error messages. System then returns user to MAIN ECONPACK MENU. |
| 2. ADD TO OR CHANGE AN EXISTING INPUT FILE |   |
| 3. EXECUTE ECONPACK                        |   |
| 4. PRINT ECONOMIC ANALYSIS REPORTS         |   |
| 5. CHECK MANUAL INPUT FILE FOR ERRORS      |   |
| 6. HELP FACILITY                           |   |
| 7. CMS                                     |   |
| 8. RETURN TO PAX MENU                      |   |

ENTER DESIRED OPTION>5 (CR)

PLEASE ENTER YOUR INPUT  
FILE NAME>[Enter your input filename.] (CR)

---

TASK 10: EXECUTE ECONPACK.

---

\*\*\* MAIN ECONPACK MENU \*\*\*

- |  |  |
|--|--|
| 1. CREATE AN INPUT FILE                    | System prompts user to select an option number. <u>3</u> entered at the option prompt initiates the executing of an ECONPACK File. <u>8</u> entered at the option prompt returns the user to the PAX System. |
| 2. ADD TO OR CHANGE AN EXISTING INPUT FILE |  |
| 3. EXECUTE ECONPACK                        |  |
| 4. PRINT ECONOMIC ANALYSIS REPORTS         |  |
| 5. CHECK MANUAL INPUT FILE FOR ERRORS      |  |
| 6. HELP FACILITY                           |  |
| 7. CMS                                     |  |
| 8. RETURN TO PAX MENU                      |  |

ENTER DESIRED OPTION>3 (CR)

7.1.2 Creating and Executing a File Using the File Input Mode  
(Continued)

---

TASK 11: SELECT DESIRED ECONPACK REPORTS.

---

AVAILABLE ECONPACK REPORTS

- |   |  |
|---|--|
| 1. PRINT ENTIRE STANDARD OUTPUT<br>FILE             | System prompts user for<br>instructions. User      |
| 2. PRINT ENTIRE OUTPUT FILE<br>FOR THE DD FORM 1391 | selects desired option and<br>enters <u>(CR)</u> . |
| 3. PRINT SUMMARY REPORT                             |  |
| 4. PRINT BY-YEAR REPORT                             |  |
| 5. PRINT PLOTS                                      |  |
| 6. LIST INPUT DATA                                  |  |
| 7. PRINT SENSITIVITY ANALYSIS                       |  |
| 8. RETURN TO ECONPACK MENU                          |  |

ENTER OPTION NUMBER===>

>[Enter option number corresponding to desired report.] (CR)

---

COMPUTER/USER INTERACTION

EXPLANATION

---

TASK 12: RETURN TO ECONPACK.

---

AVAILABLE ECONPACK REPORTS

- |   |  |
|---|--|
| 1. PRINT ENTIRE STANDARD OUTPUT<br>FILE             | System presents this menu<br>after printing reports<br>requested in TASK 11. |
| 2. PRINT ENTIRE OUTPUT FILE FOR<br>THE DD FORM 1391 | User may select another<br>option or exit ECONPACK.                          |
| 3. PRINT SUMMARY REPORT                             |  |
| 4. PRINT BY-YEAR REPORT                             |  |
| 5. PRINT PLOTS                                      |  |
| 6. LIST INPUT DATA                                  |  |
| 7. PRINT SENSITIVITY ANALYSIS                       |  |
| 8. RETURN TO ECONPACK MENU                          |  |

ENTER OPTION NUMBER.===>8 (CR)

7.1.2 Creating and Executing a File Using the File Input Mode  
(Continued)

---

TASK 13: RETURN TO PAX SYSTEM.

---

\*\*\* MAIN ECONPACK MENU \*\*\*

- |  |                          |
|--|--------------------------|
| 1. CREATE AN INPUT FILE                  | System transfers user to |
| 2. ADD TO OR CHANGE AN<br>EXISTING FILE  | PAX System.              |
| 3. EXECUTE ECONPACK                      |                          |
| 4. PRINT ECONOMIC ANALYSIS<br>REPORTS    |                          |
| 5. CHECK MANUAL INPUT FILE<br>FOR ERRORS |                          |
| 6. HELP FACILITY                         |                          |
| 7. CMS                                   |                          |
| 8. RETURN TO PAX MENU                    |                          |

ENTER DESIRED OPTION>8 (CR)

---

COMPUTER/USER INTERACTION	EXPLANATION
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---

TASK 14: LOG OFF USING PROCEDURE 3.7.5.

---

PAX SYSTEM MENU

- |                         |                |
|-------------------------|----------------|
| 1. ECONPACK             | User logs off. |
| 2. PAXMAIL              |                |
| 3. DD139 PROCESSOR      |                |
| 4. PRINT FAX NEWSLETTER |                |
| 5. CHANGE PASSWORD      |                |

PLEASE ENTER --- 1 THRU 5 OR LOG>LOG (CR)

[Terminate communications connection.]

## CHAPTER 8

### TRANSFERRING A COPY OF AN ECONPACK FILE ON TO A FORM IN THE DD FORM 1391 PROCESSOR

This chapter contains detailed procedures for logging on to the DD Form 1391 Processor and transferring a copy of an ECONPACK file into the Special Requirements Paragraph 1 block on a form in the DD Form 1391 Processor.

Below is a quick version of the procedure as presented on the system in the ECONPACK HELP FACILITY:

To move an 'Output to the 1391' file to the correct SRP-1, utilize the following steps.

FOR TEMPECON USERS: Those users who utilize the ECONPACK program found at a 1391 time of day prompt,

- 1: Go to the correct 1391 form, to the SRP-1 block,
- 2: Enter the EDIT command,
- 3: At the E>, use a GETFILE command to copy the file onto your form. (ex. GETFILE HUGH FT80F001)

FOR USERS OF ECONPACK: Those users who utilize the ECONPACK program found at the PAX MENU prompt,

- 1: Go to the DD1391 Time of Day Prompt and enter the command TEACUP2,
- 2: When prompted for, enter the filename and filetype to be moved to the 1391 form, (ex. >HUGH FT80F001)
- 3: Go to the correct 1391 form, to the SRP-1 block,
- 4: Enter the EDIT command,
- 5: At the E>, use a GETFILE command to copy the file onto your form, (ex. GETFILE HUGH FT80F001)
- 6: NOTE: You may want to erase the file that you created on your 1391 disk. This is done by going to a Time of Day Prompt and deleting the file.  
(ex. DELETE HUGH FT80F001)



TRANSFERRING A COPY OF AN ECONPACK FILE ON TO A FORM IN THE DD  
FORM 1391 PROCESSOR

STEP 1. ESTABLISH TELEPHONE COMMUNICATION WITH THE COMPUTER.

The user must first establish telephone communication with the computer. This step is accomplished in various ways dependent upon the type of equipment being used as well as how that equipment has been set up. Some users may simply have to turn the equipment on, hit a specified key on the keyboard, and the communications line will automatically be accessed. Others may have to dial the assigned telephone number, listen for a high-pitched sound, and then insert the telephone receiver in the terminal's coupler or release a specified button on the equipment's modem. Once the appropriate steps have been followed to establish telephone communication with the computer, the system will quickly prompt the user to enter a "terminal identifier". To prompt the user, the system will either display a string of garbage-like characters or actually print the words "PLEASE TYPE YOUR TERMINAL IDENTIFIER". The user should respond by entering the terminal identifier. A terminal identifier indicates to the computer the type of equipment required to communicate with the user's terminal. If the wrong identifier is entered, telephone communication will probably be terminated. [See Appendix B for a list of appropriate terminal identifiers for various equipment.]

EXAMPLE:

Establish communications line.

PLEASE TYPE YOUR TERMINAL IDENTIFIER A

-3122-007-

STEP 2: "LOG ON" TO THE COMPUTER AND THE PAX SYSTEM.

Once the terminal identifier has been entered, the system will prompt for the System User ID and System Password assigned the user's activity. These two words identify the user, the programs that user may access, and the activity to be billed for the session. If the correct System ID and Password are not entered within 2 1/2 minutes after the user establishes telephone communication, the computer will automatically disconnect. The system then prompts for a "project code." The user should enter his/her initials. The system then responds by printing the date and time the user logged on to the computer.

Once logged on to the computer, the user has immediate access to the PAX System. The system indicates the PAXMAIL status for the user's System ID. PAXMAIL is a feature of the PAX System which allows PAX users to communicate with each other. The system then responds with a "LOG ON" message which provides a variety of information. Following the log on message is a display of the PAX SYSTEM MENU in which the system lists the components of the PAX System available to the user. The number of components available to each System ID will vary. The system then prompts the user to make a selection.

EXAMPLE:

PLEASE LOG IN:  
                  [Enter your assigned System User ID.] (CR)

PASSWORD: [Enter your System Password.] (CR)

PROJECT CODE: [Enter your name initials.] (CR)

V34M 01/14/86 14:15

\* \* \* \* \*  
PAXMAIL STATUS: MAIL WAITING  
\* \* \* \* \*

SEE NEWSLETTER NO 27 FOR GREEN RIBBON PANEL/ENGINEER  
INSPECTOR GENERAL REPORT UPDATE

PLEASE HIT A CARRIAGE RETURN TO CONTINUE.  
>(CR)

PAX SYSTEM MENU

1. ECONPACK
2. PAXMAIL
3. DD1391 PROCESSOR
4. PRINT PAX NEWSLETTER
5. CHANGE PASSWORD

PLEASE ENTER --- 1 THRU 5 OR LOG

PAX>

STEP 3: "LOG ON" TO THE DD FORM 1391 PROCESSOR SYSTEM.

To access the DD Form 1391 Processor System, the user must enter the number from the PAX System Menu which identifies the DD Form 1391 Processor System. The system responds by indicating the amount of clock time and computer time used in the PAX System. It also indicates the percentage of storage space available on the user's permanent disk and gives the user a prompt (>). At the prompt, the user must enter a carriage return and the system displays the user's line editor type and the terminal display type.

The system usually prints a Log On Message pertaining to the DD Form 1391 Processor System. The message is followed by this prompt:

WOULD YOU LIKE TO READ HUNTSVILLE DIVISION BULLETIN LAST  
UPDATED:

DATE: 02/17/86  
TIME: 10:37  
(Y/N) >

This feature allows users to suppress the printing of bulletin information previously read. Users should always check the date of the last update. When new information is added to the DD Form 1391 Newsletter, a notice is usually added to the bulletin. After the bulletin, the user is prompted with a time-of-day prompt (hh:mm:ss>). All time-of-day commands are valid at this prompt. The user can access any component of the DD Form 1391 Processor System.

EXAMPLE:

LINE EDITOR TYPE IS QED ; TERMINAL DISPLAY TYPE IS IBMPC

WOULD YOU LIKE TO READ HUNTSVILLE DIV. BULLETINS LAST  
UPDATED:

DATE: 12/27/86  
TIME: 10:37  
(Y/N) >Y(CR)

\*\*\*\*\* ATTENTION \*\*\*\*\*

ALL USERS! PLEASE READ THE FOLLOWING NEWSLETTER ITEM:

---

"INFO PCEDIT" for documentation on enhanced text  
editing capabilities. (19 Dec 85)  
"INFO IMPROVE" for latest system changes. (20 Nov 85)  
"INFO PCINTRO" for basic introduction to PC's. (01 Nov 85)  
"INFO PRINT4" for latest update of this print  
processor command. (25 Oct 85)

\*\*\*\*\*

ATTN: YOU CAN ACCESS THE NEWSLETTER BY TYPING THE WORD  
- NEWS - AT THE TIME-OF-DAY PROMPT....

\*\*\*\*\*

McDONNELL-DOUGLAS' 24-HOUR HOTLINE (COMM-703-893-4243 or FTS-  
202-893-4243) IS AVAILABLE WHENEVER A USER NEEDS ASSISTANCE  
IN LOGGING ON, COMMUNICATIONS OR EQUIPMENT INTERFACE.

ALL OTHER PROBLEMS ASSOCIATED WITH THE USE OF THE DD FORM  
1391 PROCESSOR SYSTEM SHOULD BE DIRECTED TO HUNTSVILLE  
DIVISION. WHEN CALLING HUNTSVILLE, PLEASE ASK FOR COMPUTER  
ASSISTANCE ON THE 1391 PROCESSOR SYSTEM (NOT FOR A SPECIFIC  
PERSON). THE NUMBER FOR ASSISTANCE IS AV742-5266, FTS-873-  
5266 OR (205) 895-5266.

\*\*\*\*\*

TYPE HELP FOR AN EXPLANATION OF THE COMMANDS AVAILABLE TO YOU.

14:15:41 >

\*\*\*\*\*

STEP 4: USE THE TIME-OF-DAY COMMAND TEACUP2 TO MOVE A COPY OF AN ECONPACK OUTPUT FILE TO THE DD 1391 PROCESSOR PERMANENT DISK.

The command TEACUP2 issued at the time-of-day prompt assists the user in placing a copy of an Economic Analysis output file onto the DD Form 1391 Processor permanent disk. [NOTE: The output file must already exist on the user's ECONPACK permanent disk and must not exceed 80-character width. Each ECONPACK file has a filename (fn) and filetype (ft). The filename is the name given the file when the user responded to the ECONPACK INPUT FILE PROMPTING ROUTINE. The filetype is assigned by the system. The CMS command LIST can be used to get a listing of all filenames (fn ft) as they appear on the user's ECONPACK permanent disk.] Once the file has been copied to the DD1391 Processor permanent disk, the user must log on to the DD Form 1391 Processor, recall the appropriate form, move to the Special Requirements Paragraph 1 block, and use the commands EDIT, GETFILE, FILE, and /SAVE to cause the ECONPACK file to become a part of the permanent copy of the recalled form.

EXAMPLE:

Command issued: 14:15:43>TEACUP2 (CR)

Computer/User interaction:

THIS PROGRAM WILL AUTOMATICALLY COPY ANY EXISTING OUTPUT FILE FROM YOUR ECONPACK DISK TO YOUR DD 1391 PROCESSOR DISK. ONCE THE FILE IS COPIED, IT MAY BE ENTERED INTO A DD 1391 FORM BY ACCESSING THE DD 1391 PROCESSOR, RECALLING THE FORM, MOVING TO SPECIAL REQUIREMENT PARAGRAPH 1 (/GOTO SR1), AND ISSUING THE GETFILE COMMAND [GETFILE (FN) (FT)].

NOTE: THE OUTPUT FILE MUST ALREADY EXIST ON YOUR ECONPACK DISK !!!!

PLEASE ENTER FILENAME AND FILETYPE OF OUTPUT FILE (e.g. GTOUT FT80F001) OR QUIT >TEST FT80F001 (CR)  
A COPY OF TEST FT80F001 HAS BEEN STORED ON YOUR DD 1391 DISK.

11:53:48>DD1391 (CR)

\*\*\* WELCOME TO THE DD1391 PROCESSOR!  
\*\*\* VERSION 7.1 (21 FEB 85)

IDENTIFICATION:XXXXX[ENTER PROCESSOR IDENTIFICATION WORD.]

YOU HAVE JUST ENTERED INTO THE PROCESSOR AS:  
INSTALLATION - FORT USER 1

MONITOR READY >RECALL FORM XXXXX (CR)  
PROGRAM TYPE = Military Construction  
=>(CR)  
1. COMPONENT = ARMY  
=>/GOTO SR1 (CR)

SPECIAL REQUIREMENTS PARAGRAPH 1  
ENTER ONE OF THE FOLLOWING:

1. AN EDITOR COMMAND - /SAVE, /GOTO, ETC.
2. THE WORD 'EDIT' - TO INPUT NEW OR CHANGE EXISTING TEXT
3. THE WORD 'ECON' - TO LOAD ECONPACK GENERATED DATA
4. THE WORD 'DELETE' - TO ERASE ALL DATA IN THIS BLOCK
5. A CARRIAGE RETURN - TO ADVANCE TO THE NEXT BLOCK.

= >EDIT (CR)

NEW FILE:

E>GETFILE TEST FT80F001 (CR)

EOF REACHED

!

E>FILE (CR)

E>TOP (CR)

E>TYPE \*(CR)

[NOTE: The system prints out the context of the file  
moved into SR1.]

SPECIAL REQUIREMENTS PARAGRAPH 2  
ENTER ONE OF THE FOLLOWING:

1. AN EDITOR COMMAND - /SAVE, /GOTO, ETC.
2. THE WORD 'EDIT' - TO INPUT NEW OR CHANGE EXISTING TEXT
3. A CARRIAGE RETURN - TO ADVANCE TO THE NEXT BLOCK.

= >/SAVE (CR)

PREPARED BY =  
DO YOU WANT TO CHANGE NAME, OFFICE, OR PHONE? (YES/NO)  
=>N (CR)

PLEASE WAIT.... - THANK YOU.

NOW PROCESSING YOUR INSTRUCTION....

NOW PROCESSING YOUR INSTRUCTION...

NOW PROCESSING YOUR INSTRUCTION....

FORM XXXXX SAVED.

MONITOR READY >QUIT (CR)

12:42:18 >LOG (CR)

PAX>LOG (CR)

PLEASE LOG IN: [TERMINATE COMMUNICATIONS CONNECTION.]

## APPENDIX A GLOSSARY

**Alternative:** A course of action, means, or methods by which an objective may be achieved.

**Assumptions:** Explicit statements used to describe the present and future environment upon which the economic analysis is based. ECONPACK makes two assumptions: A 10% annual discount rate and no inflation. These may be changed if the housing feature is selected.

**Baseline Date:** The starting point for the economic analysis, beyond which decisions deal with future courses of action. It is the "TODAY" in the analysis. May also be referred to as the baseline year, base year, or analysis year 0.

**Base Year:** The first year in which initial investments are made or initial costs are incurred.

**Beneficial Occupancy Date (BOD):** For facilities to be occupied by the using agency, this is the date the facility is ready for occupancy.

**Benefits:** Outputs or effectiveness expected to be received or achieved over time as a result of undertaking a proposed investment.

**Benefit/Cost Ratio (BCR):** An economic indicator of efficiency, computed by dividing benefits by costs. When benefits are quantified in dollar terms, discount both the stream and the cost stream to reflect the present value of future costs and benefits.

**Breakeven Analysis:** A procedure for evaluating alternatives in terms of a common unknown variable. It involves solving for the value of the variable which will make the cumulative discounted costs for the alternatives equivalent. This value is the break-even point.

**Cash Flow Diagrams:** A pictorial representation showing the magnitudes and timing of costs associated with an alternative.

**Compound Interest:** Interest which is computed on both the original principle and its accrued interest.

**Constant Dollars:** An estimate is said to be in constant dollars if costs are adjusted so they reflect the level of prices of a base year.



NO-A165 931

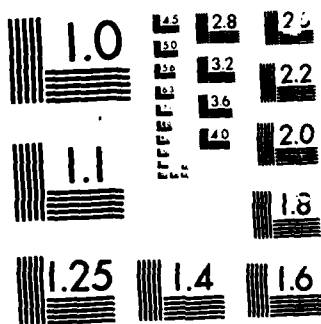
PAX ECONOPACK ECONOMIC ANALYSIS PACKAGE USER'S MANUAL  
(U) ARMY ENGINEER DIV HUNTSVILLE AL H W MASON JAN 86  
HNDSP-86-117-ED-ES

3/3

UNCLASSIFIED

**F/G 5/3**

**NEL**



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

**Cost:** A resource input to a project, program, or activity expressed in dollar terms. See Expense Item.

**Cost Avoidance:** Savings realized by avoiding a planned, nonrecurring expenditure of resources. A cost avoidance can only occur when adopting a nonstatus quo alternative.

**Cost Benefit Analysis:** A technique for assessing the range of costs and benefits associated with a given option, usually to determine possibility. Costs are generally in monetary terms, but benefits need not be in monetary terms.

**Cumulative Discounted Present Value:** The sum total of the discounted annual cost for the year in question and all preceding years of the project.

**Cumulative Net Discounted Present Value:** See Cumulative Discounted Present Value.

**Current Dollars:** When prior costs are stated in current dollars, the figures given are the actual amounts paid out. When future costs are stated in current dollars, the figures given are the actual amounts expected to be paid, including any amount caused by future price changes.

**Discount Rate:** A method of accounting for how much the value of money changes over time. ECONPACK incorporates a 10% discount rate which reduces the worth of future dollars by 10% annually. An option exists to change this rate in certain type analyses.

**Discounted Cumulative Annual Outlay:** See Cumulative Discounted Present Value.

**Discounted Payback:** A technique for determining the time period over which accumulated present value savings are enough to offset the total present value investment costs of a proposed alternative to the status quo.

**Discounted Present Value:** A monetary expenditure (or savings) multiplied by the discount rate. The resulting figure represents the worth of the future amount in base year dollars.

**Discounted Present Value Salvage:** The salvage value of an alternative discounted to represent its value in base year dollars. ECONPACK discounts the salvage value from the final year of the project to the beginning of the start year.

**Economic Analysis:** A systematic method for quantifying the costs and or benefits of proposed projects. Basically, it consists of six steps: stating the objective, listing assumptions, defining alternatives, determining costs and benefits, comparing and ranking alternatives, and performing a sensitivity analysis.

**Economic Life:** The period of time over which the benefits from an alternative are expected to accrue. The economic life of an alternative may be limited by its mission life or physical life.

**Equivalent Uniform Annual Cost (UAC):** See Uniform Annual Cost.

**Expense Item:** A term used by ECONPACK to represent a category of expenditures (costs). Each ECONPACK alternative must be composed of one or more expense items, which must be assigned a monetary value for each year of the project's economic life. See Cost.

**Historical Cost:** The cost of any objective, based on actual asset outlay, determined after the fact. Any method of cost determination may be used, but the sources of costs must be documented in the source derivation part of the output report.

**Incremental Cost:** The change in a cost associated with a change in the level of output.

**Inflation:** A persistent rise in the general level of prices over time.

**Input File:** A file which lists the objective of an economic analysis, alternatives, expense items, and other data needed to perform the analysis.

**Intangible Benefits:** Those improvements in system performance which cannot be quantified in terms of dollars or other measures.

**Interest:** A price (or rent) charged for the use of money.

**Investment Cost:** One-time costs associated with acquisition of real property, nonrecurring services, nonrecurring operations, and maintenance (start-up) costs and other one-time costs. Despite their one-time nature, investment costs may extend over periods of more than one year.

**Lead Time:** The period of elapsed time between initial funding or decision and the commencement of the economic life.

**Life Cycle:** The time from the beginning date of an alternative's use to the end of the program/project life.

**Maintenance and Repair Cost:** The total of labor, material, and other costs of performing corrective and preventive maintenance and repair on a facility and/or its systems and components.

**Net Discounted Costs:** Discounted dollar costs minus discounted dollar benefits (this can be negative value).

**Nonrecurring Cost:** Cost which occurs on a one-time basis; to be distinguished from annually recurring costs.

**Net Discounted Present Value:** A cumulative discounted present value amount that also accounts for the discounted present value residual amount.

**Objectives:** The result the decision maker wants to attain. It is the desired end product of a program and must be stated in an unbiased way, e.g., "To house 400-additional personnel, "not" to build a 400-man barracks."

**Output:** The products, functions, tasks, services, or capabilities for which an organization exists to produce, accomplish, attain, or maintain.

**Output File:** Once an input file has been run through ECONPACK, an output file representing the results of the analysis is created.

**Output Measures:** Useful descriptors of functions, tasks, or missions performed by an organization expressed in relation to those assigned.

**Period of Analysis:** The time span over which the economic analysis takes place. This period usually corresponds to the economic life of the project.

**Physical Life:** The estimated number of years that a machine, piece of equipment, or building can physically be used in accomplishing the function for which it was procured or constructed.

**Present Value:** The worth of future benefits or costs expressed in the value of money at the time of the project's base year. Present value is computed using an annual discount rate.

**Present Worth:** Same as present value.

**Project:** A major mission-oriented agency endeavor which fulfills statutory or executive requirements, and which is defined in terms of the principal actions required to achieve a significant end objective.

**Project Life:** The lead time plus the economic life.

**Ranking:** The end result of ECONPACK's economic analysis. ECONPACK ranks each alternative sequentially from lowest cost to highest cost.

**Recurring Costs:** Expenses for personnel, material consumed in use, operating overhead, support services, and other items which recur annually in the execution of a given program or work effort.

**Residual Value:** The remaining monetary value, if any, of an alternative at a specified point in time.

**Salvage Value:** The remaining monetary value, if any, of a project at the end of the project life. The value may be negative (i.e., it may cost dollars to remove the item).

**Savings/Investment Ratio (SIR):** The ratio of discounted future cost savings (or avoidance) to the discounted investment cost necessary to effect those savings. An SIR of 1 indicates that the present value of savings is equal to the present value of investment.

**Sensitivity Analysis:** A method for determining how changes in expense item costs will affect the ranking of alternatives.

**Sunk Cost:** A past cost which is incurred before the baseline date. Because sunk costs have been irrevocably expended or committed, they have no significance in choice between alternatives.

**Tangible Benefits:** Those improvements in system performance which can be quantified. They do not include savings in recurring operating expenses. These savings are reflected as reductions in cost.

**Terminal Value:** The expected value of land, buildings, or equipment at the end of economic life or project life.

**Time Value of Money:** The use of money costs money: a dollar today is worth more than a dollar tomorrow because of the interest costs related to expenditures and benefits which occur over time. Annual savings or cash inflows projected for tomorrow have present values less than their undiscounted dollar values.

**Total Annual Outlays:** The sum total of all costs for a given year.

**Uniform Annual Cost (UAC):** See Uniform Annual Equivalent.

**Uniform Annual Equivalent:** The amount of money (discounted), which if paid in equal annual installments over the life of a project, would pay for the project. The alternative with the lowest uniform annual equivalent amount is the least-costly alternative.

APPENDIX B  
VENDOR COMMUNICATIONS SPECIFICS

B VENDOR COMMUNICATIONS SPECIFICS

B.1 General. This appendix provides instructions unique to the system vendor.

B.2 Interrupting the Program. The user may interrupt a program or the execution of a command (such as the display of a form) by depressing either the ALT MODE key or the ESCAPE key. The system responds by temporarily suspending the current printout. It prints an exclamation mark (!) and then two question marks and a prompt (??>). The user should enter one of the following commands:

HT(CR)  
or  
KT(CR)

Both of these commands cause the system to suppress the printing of output associated with the current command or program and issue the next prompt in the program's prompting sequence. [NOTE: KX(CR) may also be used but only in extreme cases. This command can result in the user being logged off the system.]

B.3 Terminal Identifiers. Before a user can gain access to the host computer, a specific alphabetic character must be entered to indicate the type of equipment being used to access the system. This character is identified as the TERMINAL IDENTIFIER. Table B-1 lists the terminal identifier to be entered for specific types of terminals. Table B-2 lists terminal identifiers according to specific manufacturers and models. For equipment not listed in Table B-2, it is recommended the user first enter the terminal identifier "A". If that is ineffective, the identifier "E" should be entered.

TABLE B-1

## Terminal Identifiers According To Terminal Type

<u>IDENTIFIER</u>	<u>CODE</u>	<u>SPEED</u>	<u>TERMINAL TYPE</u>
A	ASCII	300 BAUD 1200 BAUD	*CRT
B	ASCII	150 BAUD	ALL TERMINALS
C	ASCII	300 BAUD	IMPACT PRINTERS
D	ASCII	100 BAUD	ALL TERMINALS
E	ASCII	300 BAUD	TERMINAL PRINTERS
F	ASCII	150 BAUD IN 300 BAUD OUT	BETA TERMINALS
G	ASCII	300 BAUD 1200 BAUD	BELT PRINTERS GE TERMINALS
I	ASCII	1200 BAUD	MATRIX PRINTERS
P (CR)	EBCD CORRESPONDENCE	148 BAUD	SELECTRIC-TYPE TERMINALS (e.g. 2741)

\*The terminal identifier "A" is used for terminals not requiring a carriage return or line feed delay, such as a CRT terminal. "A" is also used for terminals with buffers, such as the Tymshare 325 and the TI 820.



TABLE B-2

## Terminal Identifiers According To Manufacturer/Model

<u>TERMINAL</u> <u>MANUFACTURER/MODEL</u>	<u>TI</u>	<u>TERMINAL</u> <u>MANUFACTURER/MODEL</u>	<u>TI</u>
ADDS		DEC	
580, 620, 680, 880, 980, ...	A	GT40, LA34, LA36, LA38, *LA120, *LS120, VT05	
ANDERSON JACOBSON		VT50, VT100, VT132.....	A
330.....	(CR)	DATAMEDIA	
830, 832.....	A	DATAPOINT	
630.....	E	1500, 2000, 2100, 2500.....	A
*860.....	A	1100, 3000, 3300.....	A
ANN ARBOR TERMINALS		DATA DATA	
DESIGN III 200.....	A	5000, 5100, 5200.....	A
BEEHIVE MEDICAL ELECTRONICS		DIGI-LOG	
MINI AEE 1, 2, 4.....	B	33, 209, 300.....	A
SUPER BEE 2, 3.....	A	GENERAL ELECTRIC	
I-211, M-501, R-211.....	A	TERMINET	
BELL SYSTEM		300, 1200.....	G
DATASPEED 40/12		GEN-COM	
KD.....	A	300.....	A
KDP.....	G	HAZELLINE	
COMPUTER DEVICES		1200, 2000.....	A
1030.....	E	HYDRA	
1132, 1201, 1202, 1203		MODEL B.....	I
1204, 1205, 1206.....	A	SERIES, 7220A.....	A
COMPU TEK		IBM	
200, 300.....	A	2741.....	P(CR)
CONRAC		INTERDATA	
401, 408.....	A	CAROUSEL 300.....	E
CONTROL DATA		INCOTERM	
713.....	A	SPD 10120, 20120, 900.....	A
COMPUTER TRANSCEIVER		INFOTON	
SYSTEMS		VISTAR.....	A
EXECUPORT.....	E		

TERMINAL  
MANUFACTURE/MODEL

TI

ITT  
3501 ASCISCOPE..... A

LEAR SIEGLER  
7700,ADM-1,ADM-2  
ADM-3,ADM-31..... A

LOGABAX INFORMTIQUE  
LX180..... I  
\*LX1010..... A  
MI  
\*2400..... I

MEGADATA..... A

MEMOREX  
1240..... G

NCR  
260..... E  
796..... A

OMRON  
8525..... A

ONTEL  
4000..... A

PERKIN-ELMER  
1200,1250..... A

RESEARCH  
TELERAY 3300,3311,3712..... A

RAYTHEON  
PTS-100..... A

SINGER  
30..... E

SCIENTIFIC MEASUREMENT SYSTEMS  
1440..... A

TALLY  
\*1612..... A

TERMINAL  
MANUFACTURE/MODE

TI

TEC  
400 SERIES, 1440  
4012,4013,4014,4023..... A

TEKTRONIC  
4025..... A

TELETYPE  
33,35..... D  
38..... B  
43..... A

TEXAS INSTRUMENTS  
720,725,733,735  
743,745,763,765,771..... E  
820..... A

TEXAS SCIENTIFIC  
ENTELKON 10..... A

TYPAGRAPH  
DP-30..... C

TYMSHARE  
100,110,212,213..... E  
310,311..... C  
125,126,225,315,316  
200..... C  
325,\*350,420,\*425,430  
440W,444,\*470,  
\*550,\*1100..... A

WANG LABORATORIES  
220 OB..... A

WESTINGHOUSE  
1600,1620..... A

XEROX  
BC100,BC200..... A

\*When logging on to the computer  
using these terminals, the user  
must depress both the CONTROL  
key and the letter "R" key before  
entering the System User ID.

B.4 Additional Communication Parameters. Some word processors and microcomputers require additional information in order to connect to the Tymshare System. Listed below are some additional communication parameters.

Code	-	ASCII
Duplex	-	full
Parity	-	mark or none
Parity bits	-	1
Word length	-	7
Start bits	-	1
Stop bits	-	1
Baud	-	300 or 1200
Modem	-	Many phone numbers are compatible with any 300 baud mode, 1200 baud BELL, and Vadic modems. (Check phone numbers listed in PAX NEWSLETTERS).
End of line (transmit to TYMSHARE)	-	CR
End of line (transmit to TYMSHARE)	-	CRLF (LF)

Some terminals require the use of control characters before the user enters the System User ID at the PLEASE LOG IN: prompt. The control characters are accessed by simultaneously depressing the control (CTRL) key and the alphabet key.

CTRL X	-	Entered for terminal transmission from paper tape, cassette, internal buffer, or disk to request that TYMSHARE control the flow of terminal output with X-ON (DC-1, CTRL Q) and X-OFF (DC-3, CTRL S) to prevent data loss.
CTRL H	-	Initiates half duplex operation by suppressing TYMSHARE echoing of input characters.
CTRL P	-	Provides for even parity for computer output rather than no parity.

CTRL R - Allows terminal control of received data flow with X-ON (DC-1, CTRL Q) to signal terminal ready and X-OFF (DC-3, CTRL S) to signal terminal busy.

B.5 Line Noise. Sometimes a user may have trouble with noise, i.e., random characters showing up in the print. Often the source of the noise can be very difficult to determine. Presented below are some possible solutions to noise problems:

- Poor connection - Try hanging up the phone and redialing.
- Poor phone line - Some buildings have poor phone lines. If possible, try using a phone in a different building.
- Noisy power supply - Large ventilating units, welders, motors, etc. can transmit electrical noise over power lines to computer equipment. The computer terminal should be on a separate circuit. Try operating the terminal in a different location. An isolation transformer may help.
- Installation PBX (switchboard) - Some installation switchboards add noise to telephone lines. A direct off post line may improve the noise problem. A direct line is one where a special access code is not required to dial a commercial number.
- 1200 baud - 1200 baud modems are quite sensitive to noise. If there is a noise problem, try using a 300 baud modem.
- Acoustical coupling - The carbon microphone supplied with the telephone may not be good enough for computer communications. Try switching the microphone with another telephone. Also, electret condenser replacement microphones are available which are better than carbon microphones for use with a modem.

APPENDIX C  
REPORT FORMATS

FORMAT A-1

PRIMARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: \_\_\_\_\_
2. DATE OF SUBMISSION: \_\_\_\_\_
3. PROJECT TITLE: \_\_\_\_\_
4. PROJECT OBJECTIVE: \_\_\_\_\_  
\_\_\_\_\_
- 5A. PRESENT ALTERNATIVE: \_\_\_\_\_
- 5B. PROPOSED ALTERNATIVE: \_\_\_\_\_
- 6A. ECONOMIC LIFE: PRESENT \_\_\_\_\_
- 6B. ECONOMIC LIFE: PROPOSED \_\_\_\_\_

7.  PROJECT YEAR(S)	8. RECURRING ANNUAL OPERATIONS COSTS		9.  DIFFER- ENTIAL COST	10.  PRESENT VALUE FACTOR	11.  PRESENT VALUE OF DIFFER- ENTIAL COST
	A. PRESENT ALTERNATIVE	B. PROPOSED ALTERNA- TIVE			
12.  TOTALS					

FORMAT A-1

PRIMARY ECONOMIC ANALYSIS (CONTINUED)

13.	TOTAL PRESENT VALUE OF NEW INVESTMENT	_____
14.	PLUS: PRESENT VALUE OF EXISTING ASSETS TO BE USED	_____
15.	LESS: PRESENT VALUE OF EXISTING ASSETS REPLACED	_____
16.	LESS: PRESENT VALUE OF TERMINAL ASSET OF ALTERNATIVE	_____
17.	TOTAL PRESENT VALUE OF NET INVESTMENT (13+14-15-16)	_____
18.	PRESENT VALUE OF LCC SAVINGS (COL. 11)	_____
19.	PLUS: PRESENT VALUE OF COST OF REFURBISHMENT OR MODIFICATION ELIMINATED	_____
20.	LESS: STATUS QUO SALVAGE VALUE	_____
21.	TOTAL PRESENT VALUE OF SAVINGS (18+19-20)	_____
22.	SAVINGS/INVESTMENT RATIO (21/17)	_____
23.	DISCOUNTED PAYBACK PERIOD	_____

FORMAT A-1

PRIMARY ECONOMIC ANALYSIS (CONTINUED)

24. SOURCE/DERIVATION OF COST ESTIMATES:

A. INVESTMENT COSTS:  
(ITEMIZE)

B. RECURRING COSTS:

C. OTHER CONSIDERATIONS:

25. NAME & TITLE OF PRINCIPAL ACTION OFFICER

DATE



FORMAT A  
SECONDARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: \_\_\_\_\_
2. DATE OF SUBMISSION: \_\_\_\_\_
3. PROJECT TITLE: \_\_\_\_\_
4. DESCRIPTION OF PROGRAM OBJECTIVE: \_\_\_\_\_  
\_\_\_\_\_
5. ALTERNATIVE: \_\_\_\_\_
6. ECONOMIC LIFE: \_\_\_\_\_

			8. PROGRAM/PROJECT COSTS			
7. PROJECT YEAR(S)	A. NONRECURRING		B. RECURRING OPERATIONS	C. ANNUAL COST	D. PRESENT VALUE FACTOR	E. PRESENT VALUE
	R&D	INVESTMENT				
9. TOTALS						

- 10A. TOTAL PROJECT COST (DISCOUNTED) \_\_\_\_\_
- 10B. UNIFORM ANNUAL COST (WITHOUT TERMINAL VALUE) \_\_\_\_\_
11. LESS TERMINAL VALUE (DISCOUNTED) \_\_\_\_\_
- 12A. NET TOTAL PROJECT COST (DISCOUNTED) \_\_\_\_\_
- 12B. UNIFORM ANNUAL COST (WITH TERMINAL VALUE) \_\_\_\_\_

FORMAT A

SECONDARY ECONOMIC ANALYSIS (CONTINUED)

SOURCE/DERIVATION OF COST ESTIMATES

RECURRING COSTS:

\_\_\_\_\_

NON-RECURRING COSTS (INVESTMENT):

\_\_\_\_\_

NET TERMINAL VALUE:

\_\_\_\_\_

OTHER CONSIDERATIONS:

\_\_\_\_\_

14. NAME & TITLE OF PRINCIPAL ACTION OFFICER

\_\_\_\_\_

15. DATE

\_\_\_\_\_

FORMAT B  
SECONDARY ECONOMIC ANALYSIS  
SUMMARY OF PROJECT BENEFITS  
BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:

---

OTHER QUANTIFIABLE BENEFITS:

---

NON-QUANTIFIABLE BENEFITS:

---

SOURCE/DERIVATION OF BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:

---

OTHER QUANTIFIABLE BENEFITS:

---

NON-QUANTIFIABLE BENEFITS:

---

APPENDIX D  
SAMPLE OUTPUT

PAGE 001

D-1

INPUT LISTING  
 LINES 000051-000100

PAGE 002

0051: RECURRING COSTS ARE 8  
 0052: 2  
 0053: INVESTMENT COSTS ARE 8  
 0054: 1 3 4  
 0055: END ALTERNATIVE-1  
 0056: BEGIN ALTERNATIVE-2  
 0057: ALTERNATIVE TITLE IS 8  
 0058: 'RENOVATE BLDGS 103, 104, AND 105'  
 0059: 'DECREASE NUMBERS OF QUARTERS IN EACH BLDG'  
 0060: 'APPLY VINYL SIDING TO EXTERIORS'  
 0061: ALTERNATIVE NAME IS 'RENOVATION'  
 0062: ECONOMIC-LIFE IS '15'  
 0063: EXPENSE-ITEM-1 'RENOVATION:CONT: : 1 8  
 0064: 1\*0. 1\*350000. 15\*0.  
 0065: EXPENSE-ITEM-2 'TORN COSTS: : 1 8  
 0066: 2\*0. 15\*55000.  
 0067: EXPENSE-ITEM-3 'RECURRING:IN YEARS: : 1 8  
 0068: 9\*0. 1\*55000. 7\*0.  
 0069: EXPENSE-ITEM-4 'REPAIRS:IN YEARS: : 1 8  
 0070: 7\*0. 1\*130000. 9\*0.  
 0071: SELECT INFLATION-FACTOR IS 8  
 0072: 4\*0  
 0073: SELECT DISCOUNT-FACTOR IS 8  
 0074: 4\*2  
 0075: SELECT RESIDUAL TYPE IS 8  
 0076: SELECT RESIDUAL START VALUE IS 3000000  
 0077: SELECT RESIDUAL DISCOUNT-FACTOR IS 8  
 0078: RECURRING COSTS ARE 8  
 0079: 2  
 0080: INVESTMENT COSTS ARE 8  
 0081: 1 3 4  
 0082: END ALTERNATIVE-2  
 0083: BEGIN ALTERNATIVE-3  
 0084: ALTERNATIVE TITLE IS 8  
 0085: 'NEW OFFICERS WOULD USE AVAILABLE HOUSING'  
 0086: 'IN SURROUNDING COMMUNITIES'  
 0087: ALTERNATIVE NAME IS 'ECONOMY HOUSING'  
 0088: ECONOMIC-LIFE IS '15'  
 0089: EXPENSE-ITEM-1 'ALLOWANCES: : 1 8  
 0090: 2\*0. 15\*360000.  
 0091: EXPENSE-ITEM-2 'ADMINISTRATI: : 1 8  
 0092: 2\*0. 15\*15000.  
 0093: SELECT INFLATION-FACTOR IS 8  
 0094: 1\*1 1\*0  
 0095: SELECT DISCOUNT-FACTOR IS 8  
 0096: 2\*2  
 0097: RECURRING COSTS ARE 8  
 0098: 1 2  
 0099: END ALTERNATIVE-3  
 0100: BEGIN OUTPUT

INPUT LISTING  
 LINES 000101-000150

PAGE 003

0101: SUMMARY REPORT  
 0102: BY-YEAR REPORT  
 0103: END OUTPUT  
 0104: BEGIN GRAPHICS  
 0105: PLOT ALTERNATIVES 1 & 3  
 0106: END GRAPHICS  
 0107: BEGIN FORMAT-1  
 0108: SECONDARY ANALYSIS IS 1  
 0109: ACTION OFFICER IS TRF. JOHN SMITH, 317-575-5555  
 0110: SOURCE COSTS  
 0111: SOURCE/DERIVATION OF COST ESTIMATE:  
 0112:  
 0113: RECURRING COSTS:  
 0114: DEH RECORDS  
 0115:  
 0116: NON-RECURRING COSTS (INVESTMENT):  
 0117: DISTRICT ENGINEER OFFICE ESTIMATE - A & DEH RECORDS  
 0118:  
 0119: NET TERMINAL VALUE:  
 0120: N/A  
 0121:  
 0122: OTHER CONSIDERATIONS:  
 0123: N/A  
 0124:  
 0125: \$\$\$  
 0126: BENEFITS SECTION  
 0127: FUNCTION:  
 0128:  
 0129: DOLLAR QUANTIFIABLE BENEFITS:  
 0130: N/A  
 0131:  
 0132: OTHER QUANTIFIABLE BENEFITS:  
 0133: N/A  
 0134:  
 0135: NON-QUANTIFIABLE BENEFITS:  
 0136: BETTER MORALE AND TROOP UNIT INTEGRITY THAN IN  
 0137: ECONOMY HOUSING  
 0138:  
 0139: \$\$\$  
 0140: SOURCE BENEFITS  
 0141: SOURCE/DERIVATION OF BENEFITS:  
 0142:  
 0143: DOLLAR QUANTIFIABLE BENEFITS:  
 0144: N/A  
 0145:  
 0146: OTHER QUANTIFIABLE BENEFITS:  
 0147: N/A  
 0148:  
 0149: NON-QUANTIFIABLE BENEFITS:  
 0150: DCSFLR REPORT XXXXXXX

INPUT LISTING  
 LINES 000151-000200

PAGE 004

0151:  
 0152: \*\*\*  
 0153: END FORMAT-1  
 0154: BEGIN FORMAT-2  
 0155: SECONDARY ANALYSIS IS 2  
 0156: ACTION OFFICER IS MR. JOHN SMITH, 217-555-5555  
 0157: SOURCE COSTS  
 0158: SOURCE/DERIVATION OF COST ESTIMATES  
 0159:  
 0160: RECURRING COSTS:  
 0161: DEH RECORD  
 0162:  
 0163: NON-RECURRING COSTS (INVESTMENT):  
 0164: DISTRICT ENGINEER ESTIMATED AND DEH RECORD  
 0165:  
 0166: NET TERMINAL VALUE:  
 0167: N/A  
 0168:  
 0169: OTHER CONSIDERATIONS:  
 0170: N/A  
 0171:  
 0172: \*\*\*  
 0173: BENEFITS SECTION  
 0174: BENEFIT  
 0175:  
 0176: DOLLAR QUANTIFIABLE BENEFITS:  
 0177: N/A  
 0178:  
 0179: OTHER QUANTIFIABLE BENEFITS:  
 0180: N/A  
 0181:  
 0182: NON-QUANTIFIABLE BENEFITS:  
 0183: BETTER NOBLE AND TRUST UNIT INVESTMENT THAN THE  
 0184:  
 0185: \*\*\*  
 0186: SOURCE BENEFITS  
 0187: SOURCE/DERIVATION OF BENEFITS  
 0188:  
 0189: DOLLAR QUANTIFIABLE BENEFITS:  
 0190: N/A  
 0191:  
 0192: OTHER QUANTIFIABLE BENEFITS:  
 0193: N/A  
 0194:  
 0195: NON-QUANTIFIABLE BENEFITS:  
 0196: DOWEN REPORT 7/1/82  
 0197:  
 0198: \*\*\*  
 0199: END FORMAT-2  
 0200: BEGIN FORMAT-3



INPUT LISTING  
 LINES 000201-000250

PAGE 005

0201: SECONDARY ANALYSIS IS 3  
 0202: ACTION OFFICER IS 'MR. JOHN SMITH, 217-555-5555'  
 0203: SOURCE COSTS  
 0204: SOURCE/DERIVATION OF COST ESTIMATES  
 0205:  
 0206: RECURRING COSTS:  
 0207: TABLE OF ALLOWANCES  
 0208: DEH RECORDS  
 0209:  
 0210: OTHER CONSIDERATIONS:  
 0211: N/A  
 0212:  
 0213: \$\$\$  
 0214: BENEFITS SECTION  
 0215: BENEFITS  
 0216:  
 0217: DOLLAR QUANTIFIABLE BENEFITS:  
 0218: N/A  
 0219:  
 0220: OTHER QUANTIFIABLE BENEFITS:  
 0221: N/A  
 0222:  
 0223: NON-QUANTIFIABLE BENEFITS:  
 0224: N/A  
 0225:  
 0226: \$\$\$  
 0227: SOURCE BENEFITS  
 0228: SOURCE/DERIVATION OF BENEFITS  
 0229:  
 0230: DOLLAR QUANTIFIABLE BENEFITS:  
 0231: N/A  
 0232:  
 0233: OTHER QUANTIFIABLE BENEFITS:  
 0234: N/A  
 0235:  
 0236: NON-QUANTIFIABLE BENEFITS:  
 0237: N/A  
 0238:  
 0239: \$\$\$  
 0240: END FORMAT-3  
 0241: BEGIN RANKING SENSITIVITY ANALYSIS-1  
 0242: RUN TITLE IS 1  
 0243: ANALYSIS OF CHANGES OF O&M COSTS FOR RENOVATION ALTERNATIVE  
 0244: SELECT ALTERNATIVES 1  
 0245: 1 2 3  
 0246: CHANGE 2 2  
 0247: LIMIT IS 50,000  
 0248: RANK 1  
 0249: END RANKING-1  
 0250: \*

I N F U T   L I S T I N G  
L I N E S   0 0 0 2 5 1 - 0 0 0 3 0 0

P A G E   0 0 6

0251: STOP RUN

SUMMARY OF CALCULATION RESULTS PAGE 1  
NET DISCOUNTED PRESENT VALUE

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

ALTERNATIVE	FY1990	FY1991	FY1992
NEW CONSTRUCTION	\$2,383,656	\$378,047	\$763,052
RENOVATION	\$0	\$141,182	\$528,734
ECONOMY HOUSING	\$0	\$0	\$295,494

ALTERNATIVE	FY1993	FY1994	FY1995
NEW CONSTRUCTION	\$1,081,637	\$1,370,018	\$1,631,054
RENOVATION	\$921,693	\$1,268,062	\$1,577,365
ECONOMY HOUSING	\$564,126	\$808,330	\$1,030,345

ALTERNATIVE	FY1996	FY1997	FY1998
NEW CONSTRUCTION	\$1,867,332	\$2,081,198	\$2,274,773
RENOVATION	\$1,841,359	\$2,140,706	\$2,377,281
ECONOMY HOUSING	\$1,232,172	\$1,415,651	\$1,582,450

ALTERNATIVE	FY1999	FY2000	FY2001
NEW CONSTRUCTION	\$2,460,051	\$2,612,329	\$2,750,750
RENOVATION	\$2,619,041	\$2,771,622	\$2,871,299
ECONOMY HOUSING	\$1,734,080	\$1,871,930	\$1,997,255

ALTERNATIVE	FY2002	FY2003	FY2004
NEW CONSTRUCTION	\$2,876,557	\$3,030,789	\$3,134,312
RENOVATION	\$2,990,302	\$3,047,796	\$3,100,002
ECONOMY HOUSING	\$2,111,181	\$2,214,750	\$2,308,903

ALTERNATIVE	FY2005	FY2006
NEW CONSTRUCTION	\$3,237,128	\$3,321,893
RENOVATION	\$3,147,578	\$3,190,773

S U M M A R Y   O F   C A L C U L A T I O N   R E S U L T S  
N E T   D I S C O U N T E D   P R E S E N T   V A L U E

PAGE 2

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

ECONOMY HOUSING

\$2,394,498

\$2,472,310

SUMMARY OF CALCULATION RESULTS      PAGE 3  
NET DISCOUNTED PRESENT VALUE

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

\*\* UNIFORM ANNUAL EQUIVALENTS \*\*

1. NEW CONSTRUCTION	\$414,120
2. RENOVATION	\$397,775
3. ECONOMY HOUSING	\$308,208

S U M M A R Y   O F   C O S T S   F O R   E C O N O M I C   A N A L Y S I S  
R E P O R T   B Y   Y E A R

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

CONSTRUCT NEW QUARTERS FOR 100 OFFICERS  
SITE WILL BE A VACANT AREA ON POST

1. SUBMITTING ORGANIZATION

-----  
DEH, FT. ANYWHERE

2. DATE OF SUBMISSION

-----  
1 JANUARY 1986

3. PROJECT TITLE

-----  
PK999

4. DESCRIPTION OF PROGRAM OBJECTIVE

-----  
PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS

5. ALTERNATIVE

-----  
NEW CONSTRUCTION

6. ECONOMIC LIFE

-----  
15

7. PERIOD OF ANALYSIS

-----  
17 YEARS

8. BASE YEAR

-----  
1990

9. STARTING YEAR

-----  
1990

# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	CONSTRUCTION COST (01)	O&M COSTS (02)	RECAPPET IN YEAR 8 (03)	REDOOF IN YEAR 12 (04)	TOTAL ANNUAL OUTLAYS
1990	\$2,500,000	\$0	\$0	\$0	\$2,500,000
1991	\$1,500,000	\$0	\$0	\$0	\$1,500,000
1992	\$0	\$50,000	\$0	\$0	\$50,000
1993	\$0	\$50,000	\$0	\$0	\$50,000
1994	\$0	\$50,000	\$0	\$0	\$50,000
1995	\$0	\$50,000	\$0	\$0	\$50,000
1996	\$0	\$50,000	\$0	\$0	\$50,000
1997	\$0	\$50,000	\$0	\$0	\$50,000
1998	\$0	\$50,000	\$0	\$0	\$50,000
1999	\$0	\$50,000	\$44,000	\$0	\$144,000
2000	\$0	\$50,000	\$0	\$0	\$50,000
2001	\$0	\$50,000	\$0	\$0	\$50,000
2002	\$0	\$50,000	\$0	\$0	\$50,000
2003	\$0	\$50,000	\$0	\$150,000	\$250,000
2004	\$0	\$50,000	\$0	\$0	\$50,000
2005	\$0	\$50,000	\$0	\$0	\$50,000
2006	\$0	\$50,000	\$0	\$0	\$50,000

YEAR	DISCOUNTED PRESENT VALUE	CUMULATIVE DISCOUNTED PV	DISCOUNTED P.V. RESIDUAL	CUMULATIVE NET DISC P.V.
1990	\$2,380,656	\$2,380,656	\$0	\$2,380,656
1991	\$1,300,173	\$3,680,829	\$3,305,785	\$370,047
1992	\$89,399	\$3,770,228	\$2,960,179	\$763,052
1993	\$65,617	\$3,835,845	\$2,677,411	\$1,081,637
1994	\$52,561	\$3,888,406	\$2,461,592	\$1,370,016
1995	\$42,601	\$3,931,007	\$2,190,152	\$1,631,054
1996	\$34,910	\$3,965,917	\$1,980,785	\$1,867,332
1997	\$28,453	\$3,994,370	\$1,791,337	\$2,081,152
1998	\$22,229	\$4,016,599	\$1,620,052	\$2,274,773
1999	\$16,009	\$4,032,608	\$1,472,774	\$2,450,061
2000	\$10,380	\$4,042,988	\$1,338,867	\$2,612,329
2001	\$7,709	\$4,050,697	\$1,217,169	\$2,750,753
2002	\$5,190	\$4,055,887	\$1,106,517	\$2,876,597
2003	\$3,632	\$4,059,519	\$1,000,658	\$2,980,789
2004	\$2,553	\$4,062,072	\$909,689	\$3,074,312
2005	\$1,712	\$4,063,784	\$818,265	\$3,157,128
2006	\$1,175	\$4,064,959	\$743,895	\$3,221,653

UNIFORM ANNUAL EQUIVALENT = \$414,120 (10.00% DISCOUNT RATE, 1 YEAR)

S U M M A R Y   O F   C O S T S   F O R   E C O N O M I C   A N A L Y S I S  
R E P O R T   B Y   Y E A R

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

RENOVATE BLDGS 103, 104, AND 105  
DECREASE NUMBERS OF QUARTERS IN EACH BLDG  
APPLY VINYL SIDING TO EXTERIORS

1. SUBMITTING ORGANIZATION

-----  
DEH, FT. ANYWHERE

2. DATE OF SUBMISSION

-----  
1 JANUARY 1986

3. PROJECT TITLE

-----  
PN999

4. DESCRIPTION OF PROGRAM OBJECTIVE

-----  
PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS

5. ALTERNATIVE

-----  
RENOVATION

6. ECONOMIC LIFE

-----  
15

7. PERIOD OF ANALYSIS

-----  
17 YEARS

8. BASE YEAR

-----  
1990

9. STARTING YEAR

-----  
1990



# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	RENOVATION COST (01)	OSM COSTS (02)	RECAPPET IN YEAR 8 (03)	REROOF IN YEAR 6 (04)	TOTAL ANNUAL COSTS
1990	\$0	\$0	\$0	\$0	\$0
1991	\$3,500,000	\$0	\$0	\$0	\$3,500,000
1992	\$0	\$58,000	\$0	\$0	\$58,000
1993	\$0	\$58,000	\$0	\$0	\$58,000
1994	\$0	\$58,000	\$0	\$0	\$58,000
1995	\$0	\$58,000	\$0	\$0	\$58,000
1996	\$0	\$58,000	\$0	\$0	\$58,000
1997	\$0	\$58,000	\$0	\$100,000	\$158,000
1998	\$0	\$58,000	\$0	\$0	\$58,000
1999	\$0	\$58,000	\$58,000	\$0	\$116,000
2000	\$0	\$58,000	\$0	\$0	\$58,000
2001	\$0	\$58,000	\$0	\$0	\$58,000
2002	\$0	\$58,000	\$0	\$0	\$58,000
2003	\$0	\$58,000	\$0	\$0	\$58,000
2004	\$0	\$58,000	\$0	\$0	\$58,000
2005	\$0	\$58,000	\$0	\$0	\$58,000
2006	\$0	\$58,000	\$0	\$0	\$58,000

YEAR	DISCOUNTED PRESENT VALUE	CUMULATIVE DISCOUNTED PV	DISCOUNTED F.V. RESIDUAL	CUMULATIVE NET DISC F.V.
1990	\$0	\$0	\$0	\$0
1991	\$3,033,744	\$3,033,744	\$2,692,581	\$141,163
1992	\$45,703	\$3,079,447	\$2,550,712	\$528,734
1993	\$41,543	\$3,120,990	\$2,199,302	\$921,693
1994	\$37,771	\$3,158,761	\$1,850,704	\$1,268,063
1995	\$34,337	\$3,193,100	\$1,620,009	\$1,510,067
1996	\$31,215	\$3,224,315	\$1,362,960	\$1,841,359
1997	\$91,954	\$3,316,304	\$1,175,593	\$2,140,700
1998	\$25,796	\$3,342,102	\$964,621	\$2,377,261
1999	\$48,097	\$3,388,200	\$769,158	\$2,519,041
2000	\$21,320	\$3,409,521	\$637,858	\$2,771,623
2001	\$19,362	\$3,428,903	\$537,603	\$2,871,259
2002	\$17,620	\$3,446,524	\$458,221	\$2,990,503
2003	\$16,018	\$3,462,542	\$414,746	\$3,047,750
2004	\$14,562	\$3,477,105	\$377,042	\$3,100,063
2005	\$13,233	\$3,490,343	\$348,765	\$3,147,573
2006	\$12,035	\$3,502,378	\$311,605	\$3,190,773

UNIFORM ANNUAL EQUIVALENT = \$357,773 (10.00% DISCOUNT RATE, 30 YEARS)

S U M M A R Y   O F   C O S T S   F O R   E C O N O M I C   A N A L Y S I S  
R E P O R T   B Y   Y E A R

ECONOMIC ANALYSIS OF ALTERNATIVES FOR  
UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

NEW OFFICERS WOULD USE AVAILABLE HOUSING  
IN SURROUNDING COMMUNITIES

1. SUBMITTING ORGANIZATION

DEH, FT. ANYWHERE

2. DATE OF SUBMISSION

1 JANUARY 1986

3. PROJECT TITLE

PN999

4. DESCRIPTION OF PROGRAM OBJECTIVE

PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS

5. ALTERNATIVE

ECONOMY HOUSING

6. ECONOMIC LIFE

15

7. PERIOD OF ANALYSIS

17 YEARS

8. BASE YEAR

1990

9. STARTING YEAR

1990

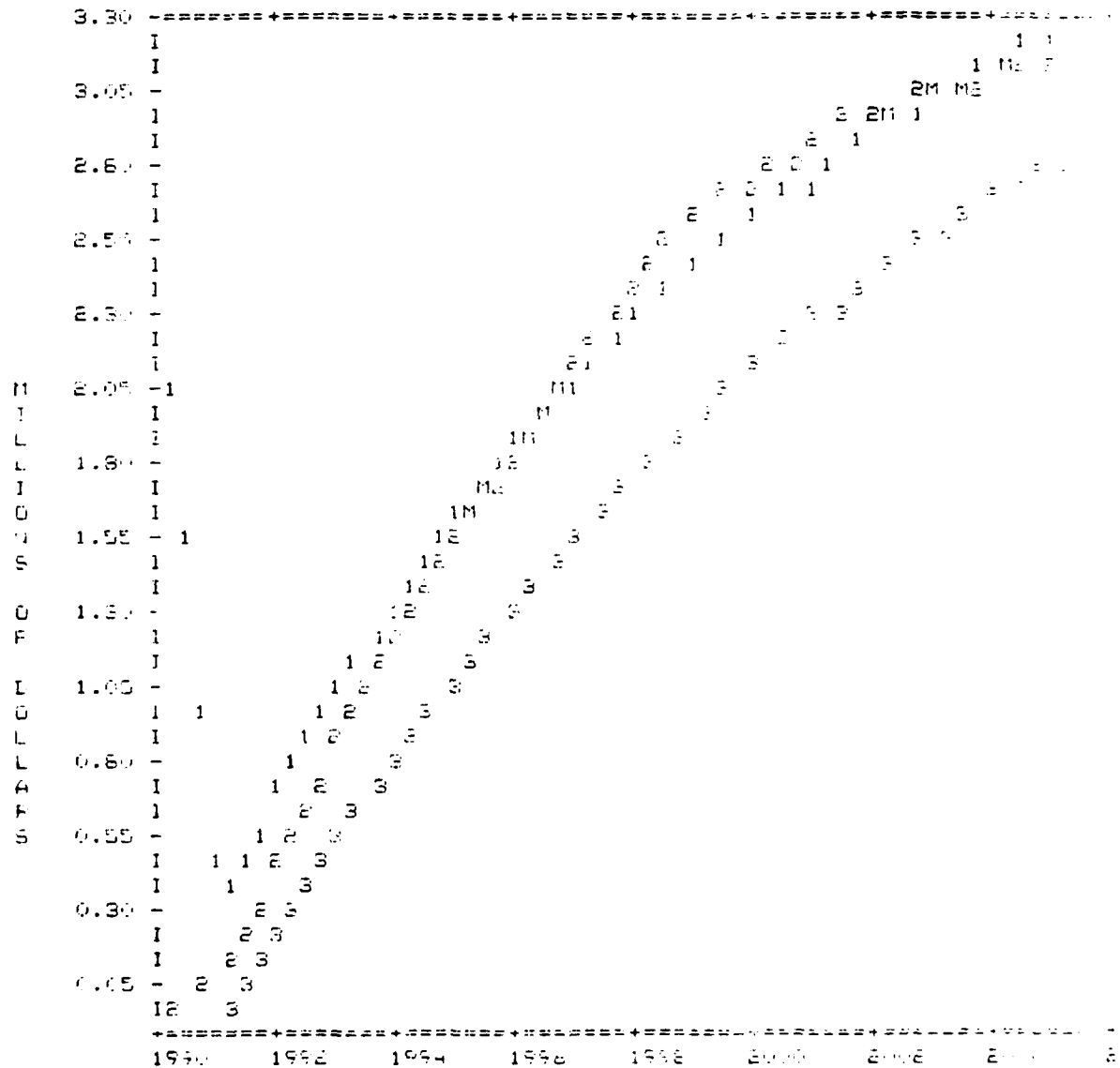
# PROJECT / PROGRAM COSTS

PAGE 000

YEAR	ALLOWANCES (01)	ADMINISTRATIVE (02)	TOTAL ANNUAL OUTLAYS	DISCOUNTED PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1990	\$0	\$0	\$0	\$0	\$0
1991	\$0	\$0	\$0	\$0	\$0
1992	\$376,014	\$15,000	\$391,014	\$340,113	\$340,113
1993	\$384,286	\$15,000	\$399,286	\$326,059	\$666,172
1994	\$393,740	\$15,000	\$408,740	\$310,503	\$976,675
1995	\$401,381	\$15,000	\$416,381	\$294,596	\$1,271,271
1996	\$410,211	\$15,000	\$425,211	\$278,690	\$1,549,961
1997	\$419,236	\$15,000	\$434,236	\$262,461	\$1,812,422
1998	\$428,454	\$15,000	\$443,454	\$246,747	\$2,059,169
1999	\$437,895	\$15,000	\$452,895	\$231,169	\$2,290,338
2000	\$447,516	\$15,000	\$462,516	\$215,000	\$2,505,338
2001	\$457,364	\$15,000	\$472,364	\$198,852	\$2,704,190
2002	\$467,436	\$15,000	\$482,436	\$183,501	\$2,887,691
2003	\$477,734	\$15,000	\$492,734	\$168,072	\$3,055,763
2004	\$488,219	\$15,000	\$503,219	\$153,546	\$3,209,309
2005	\$498,960	\$15,000	\$513,960	\$139,812	\$3,349,121
2006	\$509,937	\$15,000	\$524,937	\$126,883	\$3,476,004

UNIFORM ANNUAL EQUIVALENT = \$500,401 (10.00% DISCOUNT RATE, 10 YEAR PERIOD)

# CUMULATIVE NET PRESENT VALUE



FISCAL YEAR

LEGEND	DESCRIPTION
1	NEW CONSTRUCTION
2	RENOVATION
3	ECONOMY HOUSING

# SENSITIVITY ANALYSIS

## RANKING

### ECONOMIC ANALYSIS OF ALTERNATIVES FOR UNACCOMPANIED OFFICER HOUSING AT FORT ANYWHERE

NO. .... 001  
TITLE ..... ANALYSIS OF CHANGES OF O&M COSTS FOR RENOVATION  
ALLOWABLE CHANGE ..... 50.00 PERCENT  
TIME PERIOD ..... 17 YEARS

FOR SELECTED ALTERNATIVE .. 1  
COST ITEMS TO CHANGE ... \*\* NOTHING CHANGED \*\*

FOR SELECTED ALTERNATIVE .. 2  
COST ITEMS TO CHANGE ... 2

FOR SELECTED ALTERNATIVE .. 3  
COST ITEMS TO CHANGE ... \*\* NOTHING CHANGED \*\*

OBJECTIVE ..... RANK ALTERNATIVE 1 FIRST

## INITIAL RANKING

ALTERNATIVE NET DISCOUNTED P.V.

3	\$2,472,310
2	\$3,190,773
1	\$3,321,893

INSENSITIVE  
COST ITEMS INCREASED 50.00%

\*\*\*\*\*

\*\* END OF RUN \*\*

# SECONDARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: DEH. FT. ANYWHERE
2. DATE OF SUBMISSION: 1 JANUARY 1966
3. PROJECT TITLE: PN999
4. PROJECT OBJECTIVE: PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS
5. ALTERNATIVE 1: NEW CONSTRUCTION
6. ECONOMIC LIFE: 15 YEARS

## 8. PROGRAM PROJECT COSTS

7.	A.	B.		C.	D.	E.
PROJECT	NONRECURRING	RECURRING		ANNUAL	PRESENT	TERMINAL
YEARS	FCI	INVESTMENT	OPERATIONS	COST	VALUE	VALUE
					FACTOR	
1990	\$0	\$0.500,000	\$0	\$0.500,000	0.971	\$0.495,500
1991	\$0	\$1.500,000	\$0	\$1.500,000	0.942	\$1,413,000
1992	\$0	\$0	\$50,000	\$50,000	0.913	\$45,650
1993	\$0	\$0	\$50,000	\$50,000	0.884	\$44,200
1994	\$0	\$0	\$50,000	\$50,000	0.855	\$42,750
1995	\$0	\$0	\$50,000	\$50,000	0.826	\$41,300
1996	\$0	\$0	\$50,000	\$50,000	0.797	\$39,850
1997	\$0	\$0	\$50,000	\$50,000	0.768	\$38,400
1998	\$0	\$0	\$50,000	\$50,000	0.739	\$36,950
1999	\$0	\$44,000	\$50,000	\$94,000	0.710	\$66,500
2000	\$0	\$0	\$50,000	\$50,000	0.681	\$34,500
2001	\$0	\$0	\$50,000	\$50,000	0.652	\$33,050
2002	\$0	\$0	\$50,000	\$50,000	0.623	\$31,600
2003	\$0	\$125,000	\$50,000	\$175,000	0.594	\$104,125
2004	\$0	\$0	\$50,000	\$50,000	0.565	\$28,250
2005	\$0	\$0	\$50,000	\$50,000	0.536	\$26,800
2006	\$0	\$0	\$50,000	\$50,000	0.507	\$25,350
9.						
TOTALS	\$0	\$4,169,000	\$750,000	\$4,919,000		\$3,461,993

- 10A. TOTAL PROJECT COST (DISCOUNTED) \$4,465,769
- 10B. UNIFORM ANNUAL COST (WITHOUT TERMINAL VALUE) \$346,199
11. LESS TERMINAL VALUE (DISCOUNTED) \$1748,891
- 12A. NET TOTAL PROJECT COST (DISCOUNTED) \$2,716,878
- 12B. UNIFORM ANNUAL COST (WITH TERMINAL VALUE) \$217,330
- FR

SECONDARY ECONOMIC ANALYSIS (CONTINUED)

SOURCE/DERIVATION OF COST ESTIMATES

RECURRING COSTS:

DEH RECORDS

NON-RECURRING COSTS (INVESTMENT):

DISTRICT ENGINEER OFFICE ESTIMATES AND DEH RECORDS

NET TERMINAL VALUE:

N/A

OTHER CONSIDERATIONS:

N/A

14. NAME & TITLE OF PRINCIPAL ACTION OFFICER 15. DATE

MR. JOHN SMITH, 217-550-5555

1 JAN 1971

SUMMARY OF PROJECT BENEFITS  
BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:

N/A

OTHER QUANTIFIABLE BENEFITS:

N/A

NON-QUANTIFIABLE BENEFITS:

BETTER MORALE AND TROOP UNIT INTEGRITY THAN IN  
ECONOMY HOUSING

SOURCE/DERIVATION OF BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:

N/A

OTHER QUANTIFIABLE BENEFITS:

N/A

NON-QUANTIFIABLE BENEFITS:

DOSPER REPORT XXXX2022

# SECONDARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: DEH. FT. ANYWHERE
2. DATE OF SUBMISSION: 1 JANUARY 1988
3. PROJECT TITLE: FN999
4. PROJECT OBJECTIVE: PROVIDE HOUSING FOR 100 ADDITIONAL OFFICERS
5. ALTERNATIVE 2: RENOVATION
6. ECONOMIC LIFE: 15 YEARS

## 6. PROGRAM/PROJECT COSTS

7. PROJECT YEAR(S)	A. NONRECURRING R&D	INVESTMENT	B. RECURRING OPERATIONS	C. ANNUAL COST	D. PRESENT VALUE FACTOR	E. PRESENT FACTOR
1990	\$0	\$0	\$0	\$0	0.900	\$0
1991	\$0	\$3,500,000	\$0	\$3,500,000	0.810	\$2,835,000
1992	\$0	\$0	\$58,000	\$58,000	0.729	\$42,282
1993	\$0	\$0	\$58,000	\$58,000	0.656	\$38,064
1994	\$0	\$0	\$58,000	\$58,000	0.591	\$34,266
1995	\$0	\$0	\$58,000	\$58,000	0.533	\$30,906
1996	\$0	\$0	\$58,000	\$58,000	0.482	\$27,954
1997	\$0	\$130,000	\$58,000	\$188,000	0.437	\$82,166
1998	\$0	\$0	\$58,000	\$58,000	0.397	\$23,026
1999	\$0	\$50,000	\$58,000	\$108,000	0.361	\$38,838
2000	\$0	\$0	\$58,000	\$58,000	0.328	\$18,944
2001	\$0	\$0	\$58,000	\$58,000	0.297	\$17,226
2002	\$0	\$0	\$58,000	\$58,000	0.270	\$15,630
2003	\$0	\$0	\$58,000	\$58,000	0.245	\$14,154
2004	\$0	\$0	\$58,000	\$58,000	0.223	\$12,798
2005	\$0	\$0	\$58,000	\$58,000	0.202	\$11,556
2006	\$0	\$0	\$58,000	\$58,000	0.183	\$10,410
TOTALS	\$0	\$3,630,000	\$200,000	\$4,058,000		\$245,040

10A. TOTAL PROJECT COST (DISCOUNTED) \$3,512,370

10B. UNIFORM ANNUAL COST (WITHOUT TERMINAL VALUE) \$200,000

11. LESS TERMINAL VALUE (DISCOUNTED) \$311,800

12A. NET TOTAL PROJECT COST (DISCOUNTED) \$3,170,570

12B. UNIFORM ANNUAL COST (WITH TERMINAL VALUE) \$170,570

FF



SECONDARY ECONOMIC ANALYSIS (CONTINUED)

SOURCE/DERIVATION OF COST ESTIMATES

RECURRING COSTS:  
DEH RECORDS

NON-RECURRING COSTS (INVESTMENT):  
DISTRICT ENGINEER ESTIMATES AND DEH RECORDS

NET TERMINAL VALUE:  
N/A

OTHER CONSIDERATIONS:  
N/A

14. NAME & TITLE OF PRINCIPAL ACTION OFFICER 15. DATE

MR. JOHN STERN, 217-557-5531

1 JANUARY 1971

SUMMARY OF PROJECT BENEFITS  
BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:  
N/A

OTHER QUANTIFIABLE BENEFITS:  
N/A

NON-QUANTIFIABLE BENEFITS:  
BETTER MORALE AND TROOP UNIT INTEGRITY THAN FOR ECONOMIC REASONS

SOURCE/DERIVATION OF BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:  
N/A

OTHER QUANTIFIABLE BENEFITS:  
N/A

NON-QUANTIFIABLE BENEFITS:  
DOSREP REPORT XXX72000

# SECONDARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: DEH. FT. ANCHERLE  
 2. DATE OF SUBMISSION: 1 JANUARY 1965  
 3. PROJECT TITLE: PN999  
 4. PROJECT OBJECTIVE: PROVIDE HOUSING FOR 100 ADDITIONAL DEPENDENT  
 5. ALTERNATIVE B: ECONOMY HOUSING  
 6. ECONOMIC LIFE: 15 YEARS

## 8. PROGRAM/PROJECT COSTS

D.	H.	E.	C.	I.	F.
PROJECT	INITIAL INVESTMENT	RECURRING OPERATION	ANNUAL COST	PRESENT VALUE FACTOR	TOTAL COST
YEARS	RED	INVESTMENT			
1960	\$0	\$0	\$0	0.950	
1961	\$0	\$0	\$0	0.897	
1962	\$0	\$0	\$391,014	0.781	\$305,401
1963	\$0	\$0	\$399,884	0.731	\$291,414
1964	\$0	\$0	\$407,749	0.681	\$277,427
1965	\$0	\$0	\$416,581	0.631	\$263,440
1966	\$0	\$0	\$425,431	0.581	\$249,453
1967	\$0	\$0	\$434,281	0.531	\$235,466
1968	\$0	\$0	\$443,140	0.481	\$221,479
1969	\$0	\$0	\$452,001	0.431	\$207,492
1970	\$0	\$0	\$460,861	0.381	\$193,505
1971	\$0	\$0	\$469,721	0.331	\$179,518
1972	\$0	\$0	\$478,581	0.281	\$165,531
1973	\$0	\$0	\$487,441	0.231	\$151,544
1974	\$0	\$0	\$496,301	0.181	\$137,557
1975	\$0	\$0	\$505,161	0.131	\$123,570
1976	\$0	\$0	\$514,021	0.081	\$109,583
1977	\$0	\$0	\$522,881	0.031	\$95,596
1978	\$0	\$0	\$531,741	0.000	\$81,609
1979	\$0	\$0	\$540,601	0.000	\$67,622
1980	\$0	\$0	\$549,461	0.000	\$53,635
1981	\$0	\$0	\$558,321	0.000	\$39,648
1982	\$0	\$0	\$567,181	0.000	\$25,661
1983	\$0	\$0	\$576,041	0.000	\$11,674
1984	\$0	\$0	\$584,901	0.000	\$0
1985	\$0	\$0	\$593,761	0.000	\$0
1986	\$0	\$0	\$602,621	0.000	\$0
1987	\$0	\$0	\$611,481	0.000	\$0
1988	\$0	\$0	\$620,341	0.000	\$0
1989	\$0	\$0	\$629,201	0.000	\$0
1990	\$0	\$0	\$638,061	0.000	\$0
1991	\$0	\$0	\$646,921	0.000	\$0
1992	\$0	\$0	\$655,781	0.000	\$0
1993	\$0	\$0	\$664,641	0.000	\$0
1994	\$0	\$0	\$673,501	0.000	\$0
1995	\$0	\$0	\$682,361	0.000	\$0
1996	\$0	\$0	\$691,221	0.000	\$0
1997	\$0	\$0	\$700,081	0.000	\$0
1998	\$0	\$0	\$708,941	0.000	\$0
1999	\$0	\$0	\$717,801	0.000	\$0
2000	\$0	\$0	\$726,661	0.000	\$0
2001	\$0	\$0	\$735,521	0.000	\$0
2002	\$0	\$0	\$744,381	0.000	\$0
2003	\$0	\$0	\$753,241	0.000	\$0
2004	\$0	\$0	\$762,101	0.000	\$0
2005	\$0	\$0	\$770,961	0.000	\$0
2006	\$0	\$0	\$779,821	0.000	\$0
2007	\$0	\$0	\$788,681	0.000	\$0
2008	\$0	\$0	\$797,541	0.000	\$0
2009	\$0	\$0	\$806,401	0.000	\$0
2010	\$0	\$0	\$815,261	0.000	\$0
2011	\$0	\$0	\$824,121	0.000	\$0
2012	\$0	\$0	\$832,981	0.000	\$0
2013	\$0	\$0	\$841,841	0.000	\$0
2014	\$0	\$0	\$850,701	0.000	\$0
2015	\$0	\$0	\$859,561	0.000	\$0
2016	\$0	\$0	\$868,421	0.000	\$0
2017	\$0	\$0	\$877,281	0.000	\$0
2018	\$0	\$0	\$886,141	0.000	\$0
2019	\$0	\$0	\$895,001	0.000	\$0
2020	\$0	\$0	\$903,861	0.000	\$0
2021	\$0	\$0	\$912,721	0.000	\$0
2022	\$0	\$0	\$921,581	0.000	\$0
2023	\$0	\$0	\$930,441	0.000	\$0
2024	\$0	\$0	\$939,301	0.000	\$0
2025	\$0	\$0	\$948,161	0.000	\$0
2026	\$0	\$0	\$957,021	0.000	\$0
2027	\$0	\$0	\$965,881	0.000	\$0
2028	\$0	\$0	\$974,741	0.000	\$0
2029	\$0	\$0	\$983,601	0.000	\$0
2030	\$0	\$0	\$992,461	0.000	\$0
2031	\$0	\$0	\$1,001,321	0.000	\$0
2032	\$0	\$0	\$1,010,181	0.000	\$0
2033	\$0	\$0	\$1,019,041	0.000	\$0
2034	\$0	\$0	\$1,027,901	0.000	\$0
2035	\$0	\$0	\$1,036,761	0.000	\$0
2036	\$0	\$0	\$1,045,621	0.000	\$0
2037	\$0	\$0	\$1,054,481	0.000	\$0
2038	\$0	\$0	\$1,063,341	0.000	\$0
2039	\$0	\$0	\$1,072,201	0.000	\$0
2040	\$0	\$0	\$1,081,061	0.000	\$0
2041	\$0	\$0	\$1,089,921	0.000	\$0
2042	\$0	\$0	\$1,098,781	0.000	\$0
2043	\$0	\$0	\$1,107,641	0.000	\$0
2044	\$0	\$0	\$1,116,501	0.000	\$0
2045	\$0	\$0	\$1,125,361	0.000	\$0
2046	\$0	\$0	\$1,134,221	0.000	\$0
2047	\$0	\$0	\$1,143,081	0.000	\$0
2048	\$0	\$0	\$1,151,941	0.000	\$0
2049	\$0	\$0	\$1,160,801	0.000	\$0
2050	\$0	\$0	\$1,169,661	0.000	\$0
2051	\$0	\$0	\$1,178,521	0.000	\$0
2052	\$0	\$0	\$1,187,381	0.000	\$0
2053	\$0	\$0	\$1,196,241	0.000	\$0
2054	\$0	\$0	\$1,205,101	0.000	\$0
2055	\$0	\$0	\$1,213,961	0.000	\$0
2056	\$0	\$0	\$1,222,821	0.000	\$0
2057	\$0	\$0	\$1,231,681	0.000	\$0
2058	\$0	\$0	\$1,240,541	0.000	\$0
2059	\$0	\$0	\$1,249,401	0.000	\$0
2060	\$0	\$0	\$1,258,261	0.000	\$0
2061	\$0	\$0	\$1,267,121	0.000	\$0
2062	\$0	\$0	\$1,275,981	0.000	\$0
2063	\$0	\$0	\$1,284,841	0.000	\$0
2064	\$0	\$0	\$1,293,701	0.000	\$0
2065	\$0	\$0	\$1,302,561	0.000	\$0
2066	\$0	\$0	\$1,311,421	0.000	\$0
2067	\$0	\$0	\$1,320,281	0.000	\$0
2068	\$0	\$0	\$1,329,141	0.000	\$0
2069	\$0	\$0	\$1,338,001	0.000	\$0
2070	\$0	\$0	\$1,346,861	0.000	\$0
2071	\$0	\$0	\$1,355,721	0.000	\$0
2072	\$0	\$0	\$1,364,581	0.000	\$0
2073	\$0	\$0	\$1,373,441	0.000	\$0
2074	\$0	\$0	\$1,382,301	0.000	\$0
2075	\$0	\$0	\$1,391,161	0.000	\$0
2076	\$0	\$0	\$1,400,021	0.000	\$0
2077	\$0	\$0	\$1,408,881	0.000	\$0
2078	\$0	\$0	\$1,417,741	0.000	\$0
2079	\$0	\$0	\$1,426,601	0.000	\$0
2080	\$0	\$0	\$1,435,461	0.000	\$0
2081	\$0	\$0	\$1,444,321	0.000	\$0
2082	\$0	\$0	\$1,453,181	0.000	\$0
2083	\$0	\$0	\$1,462,041	0.000	\$0
2084	\$0	\$0	\$1,470,901	0.000	\$0
2085	\$0	\$0	\$1,479,761	0.000	\$0
2086	\$0	\$0	\$1,488,621	0.000	\$0
2087	\$0	\$0	\$1,497,481	0.000	\$0
2088	\$0	\$0	\$1,506,341	0.000	\$0
2089	\$0	\$0	\$1,515,201	0.000	\$0
2090	\$0	\$0	\$1,524,061	0.000	\$0
2091	\$0	\$0	\$1,532,921	0.000	\$0
2092	\$0	\$0	\$1,541,781	0.000	\$0
2093	\$0	\$0	\$1,550,641	0.000	\$0
2094	\$0	\$0	\$1,559,501	0.000	\$0
2095	\$0	\$0	\$1,568,361	0.000	\$0
2096	\$0	\$0	\$1,577,221	0.000	\$0
2097	\$0	\$0	\$1,586,081	0.000	\$0
2098	\$0	\$0	\$1,594,941	0.000	\$0
2099	\$0	\$0	\$1,603,801	0.000	\$0
2100	\$0	\$0	\$1,612,661	0.000	\$0
2101	\$0	\$0	\$1,621,521	0.000	\$0
2102	\$0	\$0	\$1,630,381	0.000	\$0
2103	\$0	\$0	\$1,639,241	0.000	\$0
2104	\$0	\$0	\$1,648,101	0.000	\$0
2105	\$0	\$0	\$1,656,961	0.000	\$0
2106	\$0	\$0	\$1,665,821	0.000	\$0
2107	\$0	\$0	\$1,674,681	0.000	\$0
2108	\$0	\$0	\$1,683,541	0.000	\$0
2109	\$0	\$0	\$1,692,401	0.000	\$0
2110	\$0	\$0	\$1,701,261	0.000	\$0
2111	\$0	\$0	\$1,710,121	0.000	\$0
2112	\$0	\$0	\$1,718,981	0.000	\$0
2113	\$0	\$0	\$1,727,841	0.000	\$0
2114	\$0	\$0	\$1,736,701	0.000	\$0
2115	\$0	\$0	\$1,745,561	0.000	\$0
2116	\$0	\$0	\$1,754,421	0.000	\$0
2117	\$0	\$0	\$1,763,281	0.000	\$0
2118	\$0	\$0	\$1,772,141	0.000	\$0
2119	\$0	\$0	\$1,781,001	0.000	\$0
2120	\$0	\$0	\$1,789,861	0.000	\$0
2121	\$0	\$0	\$1,798,721	0.000	\$0
2122	\$0	\$0	\$1,807,581	0.000	\$0
2123	\$0	\$0	\$1,816,441	0.000	\$0
2124	\$0	\$0	\$1,825,301	0.000	\$0
2125	\$0	\$0	\$1,834,161	0.000	\$0
2126	\$0	\$0	\$1,843,021	0.000	\$0
2127	\$0	\$0	\$1,851,881	0.000	\$0
2128	\$0	\$0	\$1,860,741	0.000	\$0
2129	\$0	\$0	\$1,869,601	0.000	\$0
2130	\$0	\$0	\$1,878,461	0.000	\$0
2131	\$0	\$0	\$1,887,321	0.000	\$0
2132	\$0	\$0	\$1,896,181	0.000	\$0
2133	\$0	\$0	\$1,905,041	0.000	\$0
2134	\$0	\$0	\$1,913,901	0.000	\$0
2135	\$0	\$0	\$1,922,761	0.000	\$0
2136	\$0	\$0	\$1,931,621	0.000	\$0
2137	\$0	\$0	\$1,940,481	0.000	\$0
2138	\$0	\$0	\$1,949,341	0.000	\$0
2139	\$0	\$0	\$1,958,201	0.000	\$0
2140	\$0	\$0	\$1,967,061	0.000	\$0
2141	\$0	\$0	\$1,975,921	0.000	\$0
2142	\$0	\$0	\$1,984,781	0.000	\$0
2143	\$0	\$0	\$1,993,641	0.000	\$0
2144	\$0	\$0	\$2,002,501	0.000	\$0
2145	\$0	\$0	\$2,011,361	0.000	\$0
2146	\$0	\$0	\$2,020,221	0.000	\$0
2147	\$0	\$0	\$2,029,081	0.000	\$0
2148	\$0	\$0	\$2,037,941	0.000	\$0
2149	\$0	\$0	\$2,046,801	0.000	\$0
2150	\$0	\$0	\$2,055,661	0.000	\$0
2151	\$0	\$0	\$2,064,521	0.000	\$0
2152	\$0	\$0	\$2,073,381	0.000	\$0
2153	\$0	\$0	\$2,082,241	0.000	\$0
2154	\$0	\$0	\$2,091,101	0.000	\$0
2155	\$0	\$0	\$2,100,000	0.000	\$0
2156	\$0	\$0	\$2,108,860	0.000	\$0
2157	\$0	\$0	\$2,117,720	0.000	\$0
2158	\$0	\$0	\$2,126,580	0.000	\$0
2159	\$0	\$0	\$2,135,440	0.000	\$0
2160	\$0	\$0	\$2,144,300	0.000	\$0
2161	\$0	\$0	\$2,153,160	0.000	\$0
2162	\$0	\$0	\$2,162,020	0.000	\$0
2163	\$0	\$0	\$2,170,880	0.000	\$0
2164	\$0	\$0	\$2,179,740	0.000	\$0
2165	\$0	\$0	\$2,188,600	0.000	\$0
2166	\$0	\$0	\$2,197,460	0.000	\$0
2167	\$0	\$0	\$2,206,320	0.000	\$0
2168	\$0	\$0	\$2,215,180	0.000	\$0
2169	\$0	\$0	\$2,224,040	0.000	\$0
2170	\$0	\$0	\$2,232,900	0.000	\$0
21717					

SECONDARY ECONOMIC ANALYSIS (CONTINUED)

SOURCE/DERIVATION OF COST ESTIMATES

RECURRING COSTS:  
TABLE OF ALLOWANCES  
DEH RECORDS

OTHER CONSIDERATIONS:  
N/A

14. NAME & TITLE OF PRINCIPAL ACTION OFFICER 15. DATE

MR. JOHN SMITH, 217-955-5555

1 JANUARY 1981

SUMMARY OF PROJECT BENEFITS  
BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:  
N/A

OTHER QUANTIFIABLE BENEFITS:  
N/A

NON-QUANTIFIABLE BENEFITS:  
N/A

SOURCE/DERIVATION OF BENEFITS

DOLLAR QUANTIFIABLE BENEFITS:  
N/A

OTHER QUANTIFIABLE BENEFITS:  
N/A

NON-QUANTIFIABLE BENEFITS:  
DCSPER REPORT XXXX2222

INPUT LISTING  
 LINES 000001-000050

PAGE 001

0001: \*  
 0002: TITLES ARE 1  
 0003: 'ECONPACK' 1  
 0004: 'PRIMARY ANALYSIS SAMPLE RUN' 1  
 0005: 'FORT XYZ PUBLICATION FACILITY'  
 0006: ORGANIZATION IS 1  
 0007: 'FOL. CORPS OF ENGINEERS'  
 0008: DATE IS 1  
 0009: 'JANUARY 1986'  
 0010: PROJECT IS 1  
 0011: 'MODERNIZATION OF PUBLICATION FACILITY'  
 0012: OBJECTIVE IS 1  
 0013: 'PRVD LST CST DOCUMENT REPRODUCTION'  
 0014: \*  
 0015: BEGIN DATA  
 0016: PERIOD IS 25  
 0017: START-YEAR IS 1952  
 0018: BASE-YEAR IS 1952  
 0019: THE RATE IS 10.00  
 0020: END DATA  
 0021: \*  
 0022: BEGIN ALTERNATIVE-1  
 0023: ALTERNATIVE TITLE IS 1  
 0024: 'CONTINUED USE OF OFFSET PRINTING METHOD'  
 0025: ALTERNATIVE NAME IS 'OFFSET PRINTING'  
 0026: ECONOMIC-LIFE IS '25 YEARS'  
 0027: EXPENSE-ITEM-1 'PERSONNEL: : ' 1  
 0028: 25\*500000.  
 0029: EXPENSE-ITEM-2 'MAINTENANCE: : ' 1  
 0030: 25\*150000.  
 0031: EXPENSE-ITEM-3 'SUPPLIES: : ' 1  
 0032: 25\*200000.  
 0033: EXPENSE-ITEM-4 'MAJOR OVERHAUL: : ' 1  
 0034: 4\*0. 1\*100000. 4\*0. 1\*100000. 4\*0. 1\*100000. 4\*0. 1\*100000. 1  
 0035: 5\*0.  
 0036: SALVAGE VALUE IS 10000.00  
 0037: RECURRING COSTS ARE 1  
 0038: 1 2 3  
 0039: REFURBISHMENT COSTS ARE 1  
 0040: 4  
 0041: END ALTERNATIVE-1  
 0042: BEGIN ALTERNATIVE-2  
 0043: ALTERNATIVE TITLE IS 1  
 0044: 'COMPUTER/LASER TECHNOLOGY BASED RETRO-SYSTEM #1'  
 0045: ALTERNATIVE NAME IS 'COMPUTER RETRO #1'  
 0046: ECONOMIC-LIFE IS '25 YEARS'  
 0047: EXPENSE-ITEM-1 'EQUIPMENT: COSTS: : ' 1  
 0048: 1\*200000. 6\*0. 1\*50000. 17\*0.  
 0049: EXPENSE-ITEM-2 'PERSONNEL: TRAINING: : ' 1  
 0050: 1\*50000. 24\*0.

INPUT LISTING  
 LINES 000051-000100

PAGE 002

0051: EXPENSE-ITEM-3 HIGH SPEED:PUNCH: : :  
 0052: 1\*5000. 24\*0.  
 0053: EXPENSE-ITEM-4 OLD:EQUIPMENT:SALE: :  
 0054: 1\*-10000. 24\*0.  
 0055: EXPENSE-ITEM-5 MAINTENANCE: : :  
 0056: 1\*150000. 24\*20000.  
 0057: EXPENSE-ITEM-6 SITE PREP: :INSTALLATION: :  
 0058: 1\*15000. 24\*0.  
 0059: EXPENSE-ITEM-7 MAJOR:OVERHAUL: : :  
 0060: 11\*0. 1\*50000. 13\*0.  
 0061: EXPENSE-ITEM-8 SUPPLIES: : :  
 0062: 1\*200000. 24\*100000.  
 0063: EXPENSE-ITEM-9 PERSONNEL: : :  
 0064: 1\*500000. 24\*200000.  
 0065: SALVAGE VALUE IS 200000.00  
 0066: RECURRING COSTS ARE :  
 0067: 5 8 9  
 0068: NEW COSTS ARE :  
 0069: 1 2 6 7  
 0070: INHERITED ASSETS ARE :  
 0071: 3  
 0072: REPLACED ASSETS ARE :  
 0073: 4  
 0074: END ALTERNATIVE-2  
 0075: BEGIN ALTERNATIVE-3  
 0076: ALTERNATIVE TITLE IS :  
 0077: COMPUTER/LASER TECHNOLOGY BASED REPRO--SYSTEM #2  
 0078: ALTERNATIVE NAME IS COMPUTER REPRO #2  
 0079: ECONOMIC-LIFE IS 125 YEARS  
 0080: EXPENSE-ITEM-1 EQUIPMENT:COST: : :  
 0081: 1\*300000. 6\*0. 1\*75000. 17\*0.  
 0082: EXPENSE-ITEM-2 PERSONNEL:TRAINING: : :  
 0083: 1\*75000. 24\*0.  
 0084: EXPENSE-ITEM-3 HIGH SPEED:PUNCH: : :  
 0085: 1\*5000. 24\*0.  
 0086: EXPENSE-ITEM-4 OLD:EQUIPMENT:SALE: :  
 0087: 1\*-10000. 24\*0.  
 0088: EXPENSE-ITEM-5 MAINTENANCE: : :  
 0089: 1\*150000. 24\*30000.  
 0090: EXPENSE-ITEM-6 SITE PREP: :INSTALLATION: :  
 0091: 1\*200000. 24\*0.  
 0092: EXPENSE-ITEM-7 MAJOR:OVERHAUL: : :  
 0093: 11\*0. 1\*75000. 13\*0.  
 0094: EXPENSE-ITEM-8 SUPPLIES: : :  
 0095: 1\*200000. 24\*80000.  
 0096: EXPENSE-ITEM-9 PERSONNEL: : :  
 0097: 1\*500000. 24\*100000.  
 0098: SALVAGE VALUE IS 200000.00  
 0099: RECURRING COSTS ARE :  
 0100: 5 8 9

INPUT LISTING  
LINES 000101-000150

PAGE 003

0101: NEW COSTS ARE 1  
0102: 1 2 6 7  
0103: INHERITED ASSETS ARE 2  
0104: 3  
0105: REPLACED ASSETS ARE 1  
0106: 4  
0107: END ALTERNATIVE-3  
0108: BEGIN OUTPUT  
0109: SUMMARY REPORT  
0110: BY-YEAR REPORT  
0111: END OUTPUT  
0112: BEGIN FORMAT-1  
0113: PRIMARY ANALYSIS  
0114: ACTION OFFICER IS 'EDWIN FOND, ENGINEERING'  
0115: PRESENT IS 1  
0116: PROPOSED IS 2  
0117: SOURCE COSTS  
0118: COSTS ARE BASED ON COMPTROLLER DATA  
0119: AND CONTRACT PROPOSAL DATA  
0120: \$\$\$  
0121: BENEFITS SECTION  
0122: SAVINGS IN TIME AND EXPENSE WILL RESULT  
0123: \$\$\$  
0124: SOURCE BENEFITS  
0125: SAVINGS ARE FROM SAME SOURCES AS ARE COST DATA  
0126: \$\$\$  
0127: END FORMAT-1  
0128: BEGIN FORMAT-2  
0129: PRIMARY ANALYSIS  
0130: ACTION OFFICER IS 'EDWIN FOND, ENGINEERING'  
0131: PRESENT IS 1  
0132: PROPOSED IS 3  
0133: SOURCE COSTS  
0134: COSTS ARE BASED ON COMPTROLLER DATA  
0135: AND CONTRACT PROPOSAL DATA  
0136: \$\$\$  
0137: BENEFITS SECTION  
0138: SAVINGS IN TIME AND EXPENSE WILL RESULT  
0139: \$\$\$  
0140: SOURCE BENEFITS  
0141: SAVINGS ARE FROM SAME SOURCES AS ARE COST DATA  
0142: \$\$\$  
0143: END FORMAT-2  
0144: BEGIN RANKING SENSITIVITY ANALYSIS-1  
0145: RUN TITLE IS 1  
0146: 'CHANGE MAINTENANCE COSTS OF ALTERNATIVE 1-STATUS QUD'  
0147: SELECT ALTERNATIVES 1  
0148: 1 2 3  
0149: CHANGE 1 2  
0150: LIMIT IS 200.00

INPUT LISTING  
LINES 000151-000200

PAGE 004

0151: RANK 2  
0152: END RANKING-1  
0153: BEGIN RANKING SENSITIVITY ANALYSIS-2  
0154: RUN TITLE IS 3  
0155: 'CHANGE MAINTENANCE COSTS IN ALTERNATIVE 3'  
0156: SELECT ALTERNATIVES 3  
0157: 1 5  
0158: CHANGE 3 5  
0159: LIMIT IS 200.00  
0160: RANK 1  
0161: END RANKING-2  
0162: \*  
0163: STOP RUN

SUMMARY OF CALCULATION RESULTS PAGE 1  
NET DISCOUNTED PRESENT VALUE

ECONFAC  
PRIMARY ANALYSIS SAMPLE RUN  
FORT AND PUBLICATION FACILITY

ALTERNATIVE	FY1992	FY1993	FY1994
OFFSET PRINT SHOP	\$810,443	\$1,547,209	\$2,018,590
COMPUTER REPRD #1	\$1,055,343	\$1,335,714	\$1,557,869
COMPUTER REPRD #2	\$1,152,293	\$1,364,318	\$1,559,000

ALTERNATIVE	FY1995	FY1996	FY1997
OFFSET PRINT SHOP	\$2,625,895	\$3,444,551	\$3,940,784
COMPUTER REPRD #1	\$1,817,101	\$2,025,444	\$2,214,340
COMPUTER REPRD #2	\$1,860,255	\$1,816,955	\$1,943,315

ALTERNATIVE	FY1998	FY1999	FY2000
OFFSET PRINT SHOP	\$4,445,257	\$4,601,142	\$5,194,611
COMPUTER REPRD #1	\$2,527,155	\$2,569,200	\$2,710,555
COMPUTER REPRD #2	\$2,454,353	\$2,195,775	\$2,287,111

ALTERNATIVE	FY2001	FY2002	FY2003
OFFSET PRINT SHOP	\$5,583,353	\$5,895,824	\$6,174,641
COMPUTER REPRD #1	\$3,401,911	\$3,907,564	\$3,681,211
COMPUTER REPRD #2	\$2,372,102	\$2,445,254	\$2,544,541

ALTERNATIVE	FY2004	FY2005	FY2006
OFFSET PRINT SHOP	\$6,438,112	\$6,672,865	\$6,911,371
COMPUTER REPRD #1	\$3,178,428	\$3,266,907	\$3,347,171
COMPUTER REPRD #2	\$2,606,339	\$2,655,330	\$2,719,441

ALTERNATIVE	FY2007	FY2008	FY2009
OFFSET PRINT SHOP	\$7,105,405	\$7,281,781	\$7,448,125
COMPUTER REPRD #1	\$3,420,192	\$3,483,592	\$3,542,955



SUMMARY OF CALCULATION RESULTS PAGE 2  
NET DISCOUNTED PRESENT VALUE

ECONOMIC  
PRIMARY ANALYSIS SAMPLE RUN  
FORT XYZ PUBLICATION FACILITY

COMPUTER REPRO #2	\$2,755,996	\$2,810,571	\$2,865,146
ALTERNATIVE	FY2010	FY2011	FY2012
-----	-----	-----	-----
OFFSET PRINT SHOP	\$7,557,888	\$7,735,992	\$7,858,454
COMPUTER REPRO #1	\$3,601,833	\$3,651,720	\$3,698,475
COMPUTER REPRO #2	\$2,856,196	\$2,916,937	\$2,940,443
ALTERNATIVE	FY2013	FY2014	FY2015
-----	-----	-----	-----
OFFSET PRINT SHOP	\$7,965,975	\$8,065,534	\$8,150,444
COMPUTER REPRO #1	\$3,758,302	\$3,775,763	\$3,794,475
COMPUTER REPRO #2	\$2,975,752	\$3,000,356	\$3,020,475
ALTERNATIVE	FY2016		
-----	-----		
OFFSET PRINT SHOP	\$8,257,401		
COMPUTER REPRO #1	\$3,830,958		
COMPUTER REPRO #2	\$3,041,196		

SUMMARY OF CALCULATION RESULTS      PAGE 3  
NET DISCOUNTED PRESENT VALUE

ECONPAC1  
PRIMARY ANALYSIS SAMPLE RUN  
FOR1 XYZ PUBLICATION FACILITY

→ UNIFORM ANNUAL EQUIVALENTS →

1. OFFSET PRINT SHOP	\$907.498
2. COMPUTER REPRO #1	\$422.932
3. COMPUTER REPRO #2	\$308.042

SUMMARY OF COSTS FOR ECONOMIC ANALYSIS  
REPORT BY YEAR

ECONPACK  
PRIMARY ANALYSIS SAMPLE RUN  
FOR A XYZ PUBLICATION FACILITY

CONTINUED USE OF OFFSET PRINTING METHODS

1. SUBMITTING ORGANIZATION  
-----  
FOR. CORPS OF ENGINEERS

2. DATE OF SUBMISSION  
-----  
JANUARY 1980

3. PROJECT TITLE  
-----  
MODERNIZATION OF PUBLICATION FACILITY

4. DESCRIPTION OF PROGRAM OBJECTIVE  
-----  
PROVIDE LST COST DOCUMENT REPRODUCTION

5. ALTERNATIVE  
-----  
OFFSET PRINT SHOP

6. ECONOMIC LIFE  
-----  
25 YEARS

7. PERIOD OF ANALYSIS  
-----  
25 YEARS

8. BASE YEAR  
-----  
1992

9. STARTING YEAR  
-----  
1992

# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	PERSONNEL A (01)	MAINTENANCE (02)	SUPPLIES (03)	MAJOR OVERHAUL (04)	TOTAL ANNUAL COSTS
1992	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1993	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1994	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1995	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1996	\$500,000	\$150,000	\$200,000	\$100,000	\$950,000
1997	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1998	\$500,000	\$150,000	\$200,000	\$0	\$850,000
1999	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2000	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2001	\$500,000	\$150,000	\$200,000	\$100,000	\$950,000
2002	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2003	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2004	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2005	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2006	\$500,000	\$150,000	\$200,000	\$100,000	\$950,000
2007	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2008	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2009	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2010	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2011	\$500,000	\$150,000	\$200,000	\$100,000	\$950,000
2012	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2013	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2014	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2015	\$500,000	\$150,000	\$200,000	\$0	\$850,000
2016	\$500,000	\$150,000	\$200,000	\$0	\$850,000

# PROJECT / PROGRAM COSTS

Page 100

YEAR	DISCOUNTED PRESENT VALUE	CUMULATIVE DISCOUNTED PV	DISCOUNTED F.V. RESIDUAL	CUMULATIVE NET DISC F.V.
1992	\$810.443	\$810.443	\$0	\$810.443
1993	\$736.766	\$1,547.209	\$0	\$1,547.209
1994	\$669.767	\$2,216.977	\$0	\$2,216.977
1995	\$608.897	\$2,825.875	\$0	\$2,825.875
1996	\$546.666	\$3,372.541	\$0	\$3,372.541
1997	\$503.221	\$3,875.763	\$0	\$3,875.763
1998	\$457.474	\$4,333.237	\$0	\$4,333.237
1999	\$412.865	\$4,746.102	\$0	\$4,746.102
2000	\$376.077	\$5,122.179	\$0	\$5,122.179
2001	\$344.143	\$5,466.323	\$0	\$5,466.323
2002	\$312.460	\$5,778.783	\$0	\$5,778.783
2003	\$284.055	\$6,062.838	\$0	\$6,062.838
2004	\$258.230	\$6,321.068	\$0	\$6,321.068
2005	\$234.758	\$6,555.826	\$0	\$6,555.826
2006	\$213.522	\$6,769.348	\$0	\$6,769.348
2007	\$194.013	\$6,963.361	\$0	\$6,963.361
2008	\$176.376	\$7,139.737	\$0	\$7,139.737
2009	\$160.341	\$7,299.078	\$0	\$7,299.078
2010	\$145.765	\$7,444.843	\$0	\$7,444.843
2011	\$133.193	\$7,578.036	\$0	\$7,578.036
2012	\$122.457	\$7,699.493	\$0	\$7,699.493
2013	\$113.515	\$7,813.008	\$0	\$7,813.008
2014	\$106.559	\$7,919.567	\$0	\$7,919.567
2015	\$99.508	\$8,019.075	\$0	\$8,019.075
2016	\$92.280	\$8,111.355	\$92.280	\$8,111.355

UNIFORM ANNUAL EQUIVALENT = \$907.493 (10.0% DISCOUNT RATE)

SUMMARY OF COSTS FOR ECONOMIC ANALYSIS  
REPORT BY YEAR

ECONPRO  
PRIMARY ANALYSIS SAMPLE RUN  
FORT MYD PUBLICATION FACILITY

COMPUTER/LASER TECHNOLOGY BASED REPRO-SYSTEM #1

1. SUBMITTING ORGANIZATION

FOI, CORPS OF ENGINEERS

2. DATE OF SUBMISSION

JANUARY 1996

3. PROJECT TITLE

MODERNIZATION OF PUBLICATION FACILITY

4. DESCRIPTION OF PROGRAM OBJECTIVE

FRYD LST CST DOCUMENT REPRODUCTION

5. ALTERNATIVE

COMPUTER REPRO #1

6. ECONOMIC LIFE

25 YEARS

7. PERIOD OF ANALYSIS

25 YEARS

8. BASE YEAR

1992

9. STARTING YEAR

1992

# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	EQUIPMENT COSTS L (01)	PERSONNEL TRAINING (02)	HIGH SPEED PUNCH (03)	OLD EQUIPMENT SALE (04)	MAINTENANCE (05)
1992	\$200,000	\$50,000	\$5,000	-\$10,000	\$150,000
1993	\$0	\$0	\$0	\$0	\$150,000
1994	\$0	\$0	\$0	\$0	\$150,000
1995	\$0	\$0	\$0	\$0	\$150,000
1996	\$0	\$0	\$0	\$0	\$150,000
1997	\$0	\$0	\$0	\$0	\$150,000
1998	\$0	\$0	\$0	\$0	\$150,000
1999	\$50,000	\$0	\$0	\$0	\$150,000
2000	\$0	\$0	\$0	\$0	\$150,000
2001	\$0	\$0	\$0	\$0	\$150,000
2002	\$0	\$0	\$0	\$0	\$150,000
2003	\$0	\$0	\$0	\$0	\$150,000
2004	\$0	\$0	\$0	\$0	\$150,000
2005	\$0	\$0	\$0	\$0	\$150,000
2006	\$0	\$0	\$0	\$0	\$150,000
2007	\$0	\$0	\$0	\$0	\$150,000
2008	\$0	\$0	\$0	\$0	\$150,000
2009	\$0	\$0	\$0	\$0	\$150,000
2010	\$0	\$0	\$0	\$0	\$150,000
2011	\$0	\$0	\$0	\$0	\$150,000
2012	\$0	\$0	\$0	\$0	\$150,000
2013	\$0	\$0	\$0	\$0	\$150,000
2014	\$0	\$0	\$0	\$0	\$150,000
2015	\$0	\$0	\$0	\$0	\$150,000
2016	\$0	\$0	\$0	\$0	\$150,000

# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	SITE PREP & INSTALLATION (05)	MAJOR OVERHAUL (07)	SUPPLIES (08)	PERSONNEL (09)	TOTAL ANNUAL OUTLAYS
1992	\$15,000	\$0	\$200,000	\$500,000	\$1,115,000
1993	\$0	\$0	\$100,000	\$200,000	\$300,000
1994	\$0	\$0	\$100,000	\$200,000	\$300,000
1995	\$0	\$0	\$100,000	\$200,000	\$300,000
1996	\$0	\$0	\$100,000	\$200,000	\$300,000
1997	\$0	\$0	\$100,000	\$200,000	\$300,000
1998	\$0	\$0	\$100,000	\$200,000	\$300,000
1999	\$0	\$0	\$100,000	\$200,000	\$300,000
2000	\$0	\$0	\$100,000	\$200,000	\$300,000
2001	\$0	\$0	\$100,000	\$200,000	\$300,000
2002	\$0	\$0	\$100,000	\$200,000	\$300,000
2003	\$0	\$50,000	\$100,000	\$200,000	\$350,000
2004	\$0	\$0	\$100,000	\$200,000	\$300,000
2005	\$0	\$0	\$100,000	\$200,000	\$300,000
2006	\$0	\$0	\$100,000	\$200,000	\$300,000
2007	\$0	\$0	\$100,000	\$200,000	\$300,000
2008	\$0	\$0	\$100,000	\$200,000	\$300,000
2009	\$0	\$0	\$100,000	\$200,000	\$300,000
2010	\$0	\$0	\$100,000	\$200,000	\$300,000
2011	\$0	\$0	\$100,000	\$200,000	\$300,000
2012	\$0	\$0	\$100,000	\$200,000	\$300,000
2013	\$0	\$0	\$100,000	\$200,000	\$300,000
2014	\$0	\$0	\$100,000	\$200,000	\$300,000
2015	\$0	\$0	\$100,000	\$200,000	\$300,000
2016	\$0	\$0	\$100,000	\$200,000	\$300,000



# PROJECT / PROGRAM COSTS

PAGE 003

YEAR	DISCOUNTED PRESENT VALUE	CUMULATIVE DISCOUNTED PV	DISCOUNTED F.V. RESIDUAL	CUMULATIVE NET DISC F.V.
1993	\$1,058,343	\$1,058,343	\$0	\$1,058,343
1993	\$277,370	\$1,335,714	\$0	\$1,335,714
1994	\$252,155	\$1,587,869	\$0	\$1,587,869
1995	\$229,232	\$1,817,101	\$0	\$1,817,101
1996	\$208,392	\$2,025,494	\$0	\$2,025,494
1997	\$189,448	\$2,214,942	\$0	\$2,214,942
1998	\$172,223	\$2,387,165	\$0	\$2,387,165
1999	\$158,032	\$2,545,197	\$0	\$2,545,197
2000	\$142,335	\$2,710,532	\$0	\$2,710,532
2001	\$129,395	\$2,839,927	\$0	\$2,839,927
2002	\$117,832	\$3,007,759	\$0	\$3,007,759
2003	\$108,647	\$3,061,211	\$0	\$3,061,211
2004	\$97,216	\$3,178,426	\$0	\$3,178,426
2005	\$86,272	\$3,264,698	\$0	\$3,264,698
2006	\$76,344	\$3,347,151	\$0	\$3,347,151
2007	\$73,040	\$3,420,192	\$0	\$3,420,192
2008	\$68,400	\$3,488,592	\$0	\$3,488,592
2009	\$60,323	\$3,548,915	\$0	\$3,548,915
2010	\$54,876	\$3,601,791	\$0	\$3,601,791
2011	\$49,847	\$3,651,720	\$0	\$3,651,720
2012	\$45,352	\$3,697,072	\$0	\$3,697,072
2013	\$41,224	\$3,734,302	\$0	\$3,734,302
2014	\$37,421	\$3,775,723	\$0	\$3,775,723
2015	\$34,073	\$3,809,797	\$0	\$3,809,797
2016	\$30,975	\$3,840,854	\$1,645	\$3,839,209

UNIFORM ANNUAL EQUIVALENT = \$422,933 (10.00% DISCOUNT RATE, 20 YEARS)

S U M M A R Y   O F   C O S T S   F O R   E C O N O M I C   A N A L Y S I S  
R E P O R T   B Y   Y E A R

ECONFACI  
PRIMARY ANALYSIS SAMPLE RUN  
FORT XYZ PUBLICATION FACILITY

COMPUTER/LASER TECHNOLOGY BASED REPRO--SYSTEM #2

1. SUBMITTING ORGANIZATION

-----  
POD. CORPS OF ENGINEERS

2. DATE OF SUBMISSION

-----  
JANUARY 1988

3. PROJECT TITLE

-----  
MODERNIZATION OF PUBLICATION FACILITY

4. DESCRIPTION OF PROGRAM OBJECTIVE

-----  
PRVD LST CST DOCUMET REPRODUCTION

5. ALTERNATIVE

-----  
COMPUTER REPRO #2

6. ECONOMIC LIFE

-----  
25 YEARS

7. PERIOD OF ANALYSIS

-----  
25 YEARS

8. BASE YEAR

-----  
1982

9. STARTING YEAR

-----  
1992

# PROJECT / PROGRAM COSTS

PAGE 001

YEAR	EQUIPMENT COST (01)	PERSONNEL TRAINING (02)	HIGH SPEED PUNCH (03)	OLD EQUIPMENT SALE (04)	MAINTENANCE (05)
1992	\$300,000	\$75,000	\$5,000	~\$10,000	\$150,000
1993	\$0	\$0	\$0	\$0	\$150,000
1994	\$0	\$0	\$0	\$0	\$150,000
1995	\$0	\$0	\$0	\$0	\$150,000
1996	\$0	\$0	\$0	\$0	\$150,000
1997	\$0	\$0	\$0	\$0	\$150,000
1998	\$0	\$0	\$0	\$0	\$150,000
1999	\$75,000	\$0	\$0	\$0	\$150,000
2000	\$0	\$0	\$0	\$0	\$150,000
2001	\$0	\$0	\$0	\$0	\$150,000
2002	\$0	\$0	\$0	\$0	\$150,000
2003	\$0	\$0	\$0	\$0	\$150,000
2004	\$0	\$0	\$0	\$0	\$150,000
2005	\$0	\$0	\$0	\$0	\$150,000
2006	\$0	\$0	\$0	\$0	\$150,000
2007	\$0	\$0	\$0	\$0	\$150,000
2008	\$0	\$0	\$0	\$0	\$150,000
2009	\$0	\$0	\$0	\$0	\$150,000
2010	\$0	\$0	\$0	\$0	\$150,000
2011	\$0	\$0	\$0	\$0	\$150,000
2012	\$0	\$0	\$0	\$0	\$150,000
2013	\$0	\$0	\$0	\$0	\$150,000
2014	\$0	\$0	\$0	\$0	\$150,000
2015	\$0	\$0	\$0	\$0	\$150,000
2016	\$0	\$0	\$0	\$0	\$150,000

# PROJECT / PROGRAM COSTS

PAGE 006

YEAR	SITE PREP & INSTALLATION (06)	MAJOR OVERHAUL (07)	SUPPLIES (08)	PERSONNEL (09)	TOTAL ANNUAL OUTLAYS
1992	\$20,000	\$0	\$200,000	\$500,000	\$1,240,000
1993	\$0	\$0	\$80,000	\$100,000	\$180,000
1994	\$0	\$0	\$80,000	\$100,000	\$180,000
1995	\$0	\$0	\$80,000	\$100,000	\$180,000
1996	\$0	\$0	\$80,000	\$100,000	\$180,000
1997	\$0	\$0	\$80,000	\$100,000	\$180,000
1998	\$0	\$0	\$80,000	\$100,000	\$180,000
1999	\$0	\$0	\$80,000	\$100,000	\$180,000
2000	\$0	\$0	\$80,000	\$100,000	\$180,000
2001	\$0	\$0	\$80,000	\$100,000	\$180,000
2002	\$0	\$0	\$80,000	\$100,000	\$180,000
2003	\$0	\$75,000	\$80,000	\$100,000	\$225,000
2004	\$0	\$0	\$80,000	\$100,000	\$180,000
2005	\$0	\$0	\$80,000	\$100,000	\$180,000
2006	\$0	\$0	\$80,000	\$100,000	\$180,000
2007	\$0	\$0	\$80,000	\$100,000	\$180,000
2008	\$0	\$0	\$80,000	\$100,000	\$180,000
2009	\$0	\$0	\$80,000	\$100,000	\$180,000
2010	\$0	\$0	\$80,000	\$100,000	\$180,000
2011	\$0	\$0	\$80,000	\$100,000	\$180,000
2012	\$0	\$0	\$80,000	\$100,000	\$180,000
2013	\$0	\$0	\$80,000	\$100,000	\$180,000
2014	\$0	\$0	\$80,000	\$100,000	\$180,000
2015	\$0	\$0	\$80,000	\$100,000	\$180,000
2016	\$0	\$0	\$80,000	\$100,000	\$180,000

# PROJECT / PROGRAM COSTS

PAGE 003

YEAR	DISCOUNTED PRESENT VALUE	CUMULATIVE DISCOUNTED PV	DISCOUNTED P.V. RESIDUAL	CUMULATIVE NET DISC P.V.
1992	\$1,182,293	\$1,182,293	\$0	\$1,182,293
1993	\$182,024	\$1,364,318	\$0	\$1,364,318
1994	\$165,476	\$1,529,795	\$0	\$1,529,795
1995	\$150,433	\$1,680,228	\$0	\$1,680,228
1996	\$136,757	\$1,816,986	\$0	\$1,816,986
1997	\$124,325	\$1,941,312	\$0	\$1,941,312
1998	\$113,023	\$2,054,335	\$0	\$2,054,335
1999	\$103,443	\$2,157,778	\$0	\$2,157,778
2000	\$93,407	\$2,251,185	\$0	\$2,251,185
2001	\$84,915	\$2,336,100	\$0	\$2,336,100
2002	\$77,196	\$2,413,296	\$0	\$2,413,296
2003	\$69,242	\$2,482,538	\$0	\$2,482,538
2004	\$63,793	\$2,546,331	\$0	\$2,546,331
2005	\$57,998	\$2,604,329	\$0	\$2,604,329
2006	\$52,726	\$2,657,055	\$0	\$2,657,055
2007	\$47,932	\$2,704,987	\$0	\$2,704,987
2008	\$43,575	\$2,748,562	\$0	\$2,748,562
2009	\$39,613	\$2,788,175	\$0	\$2,788,175
2010	\$36,012	\$2,824,187	\$0	\$2,824,187
2011	\$32,738	\$2,856,925	\$0	\$2,856,925
2012	\$29,762	\$2,886,687	\$0	\$2,886,687
2013	\$27,056	\$2,913,743	\$0	\$2,913,743
2014	\$24,557	\$2,938,300	\$0	\$2,938,300
2015	\$22,300	\$2,960,600	\$0	\$2,960,600
2016	\$20,322	\$2,980,922	\$1,845	\$2,982,767

UNIFORM ANNUAL EQUIVALENT = \$355,042 (10.0% DISCOUNT RATE, 20 YEAR)

# SENSITIVITY ANALYSIS

## RANKING

ECONRAD  
PRIMARY ANALYSIS SAMPLE RUN  
FORT XYZ PUBLICATION FACILITY

NO. .... 001  
TITLE ..... CHANGE MAINTENANCE COSTS OF ALTERNATIVE 1  
DUO  
ALLOWABLE CHANGE ..... 200.00 PERCENT  
TIME PERIOD ..... 25 YEARS  
  
FOR SELECTED ALTERNATIVE .. 1  
COST ITEMS TO CHANGE ... 2  
  
FOR SELECTED ALTERNATIVE .. 2  
COST ITEMS TO CHANGE ... \*\* NOTHING CHANGED \*\*  
  
FOR SELECTED ALTERNATIVE .. 3  
COST ITEMS TO CHANGE ... \*\* NOTHING CHANGED \*\*  
  
OBJECTIVE ..... RANK ALTERNATIVE 2 FIRST

## INITIAL RANKING

ALTERNATIVE NET DISCOUNTED P.V.

3	\$3,041.196
2	\$3,839.988
1	\$8,237.401

INSENSITIVE  
COST ITEMS REDUCED TO ZERO

\*\*\*\*\*

# SENSITIVITY ANALYSIS

## RANKING

ECONFACI  
PRIMARY ANALYSIS SAMPLE RUN  
FORT XYZ PUBLICATION FACILITY

NO. .... 002  
TITLE ..... CHANGE MAINTENANCE COSTS FOR ALTERNATIVE 1  
ALLOWABLE CHANGE ..... 200.00 PERCENT  
TIME PERIOD ..... 25 YEARS

FOR SELECTED ALTERNATIVE .. 1  
COST ITEMS TO CHANGE ... \*\* NOTHING CHANGED \*\*

FOR SELECTED ALTERNATIVE .. 3  
COST ITEMS TO CHANGE ... 5

OBJECTIVE ..... RANK ALTERNATIVE 1 FIRST

## INITIAL RANKING

ALTERNATIVE NET DISCOUNTED P.V.

3	\$3,041.196
1	\$6,237.401

INSENSITIVE  
COST ITEMS INCREASED 200.00%

\*\*\*\*\*  
\*\* END OF RUN \*\*

# PRIMARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: FOD, CORPS OF ENGINEERS  
 2. DATE OF SUBMISSION: JANUARY 1986  
 3. PROJECT TITLE: MODERNIZATION OF PUBLICATION FACILITY  
 4. PROJECT OBJECTIVE: PRVD LST CST DOCUMENT REPRODUCTION  
 5A. PRESENT ALTERNATIVE: OFFSET PRINT SHOP  
 5B. PROPOSED ALTERNATIVE: COMPUTER REPRD #1  
 6A. ECONOMIC LIFE: PRESENT 25 YEARS  
 6B. ECONOMIC LIFE: PROPOSED 25 YEARS

7.	8. RECURRING ANNUAL OPERATIONS COSTS		9.	10.	11.
PROJECT YEAR (S)	A. PRESENT ALTERNATIVE	B. PROPOSED ALTERNATIVE	DIFFERENTIAL COST	PRESENT VALUE FACTOR	PRESENT VALUE DIFFERENTIAL COST
1992	\$850,000	\$320,000	\$530,000	0.850	\$450,850
1993	\$850,000	\$320,000	\$530,000	0.857	\$454,437
1994	\$850,000	\$320,000	\$530,000	0.761	\$403,607
1995	\$850,000	\$320,000	\$530,000	0.718	\$379,147
1996	\$850,000	\$320,000	\$530,000	0.681	\$360,136
1997	\$850,000	\$320,000	\$530,000	0.650	\$344,072
1998	\$850,000	\$320,000	\$530,000	0.623	\$329,434
1999	\$850,000	\$320,000	\$530,000	0.600	\$316,000
2000	\$850,000	\$320,000	\$530,000	0.579	\$303,672
2001	\$850,000	\$320,000	\$530,000	0.560	\$292,360
2002	\$850,000	\$320,000	\$530,000	0.542	\$281,984
2003	\$850,000	\$320,000	\$530,000	0.525	\$272,464
2004	\$850,000	\$320,000	\$530,000	0.509	\$263,712
2005	\$850,000	\$320,000	\$530,000	0.494	\$255,648
2006	\$850,000	\$320,000	\$530,000	0.479	\$248,288
2007	\$850,000	\$320,000	\$530,000	0.465	\$241,552
2008	\$850,000	\$320,000	\$530,000	0.451	\$235,360
2009	\$850,000	\$320,000	\$530,000	0.438	\$229,632
2010	\$850,000	\$320,000	\$530,000	0.425	\$224,368
2011	\$850,000	\$320,000	\$530,000	0.413	\$219,472
2012	\$850,000	\$320,000	\$530,000	0.401	\$214,944
2013	\$850,000	\$320,000	\$530,000	0.390	\$210,784
2014	\$850,000	\$320,000	\$530,000	0.379	\$206,992
2015	\$850,000	\$320,000	\$530,000	0.369	\$203,568
2016	\$850,000	\$320,000	\$530,000	0.359	\$200,512
12. TOTALS	\$21,250,000	\$8,530,000	\$12,720,000		\$4,540,000

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# PRIMARY ECONOMIC ANALYSIS (CONTINUED)

13. TOTAL PRESENT VALUE OF NEW INVESTMENT	\$293,840
14. PLUS: PRESENT VALUE OF EXISTING ASSETS TO BE USED	\$4,750
15. LESS: PRESENT VALUE OF EXISTING ASSETS REPLACED	\$4,530
16. LESS: PRESENT VALUE OF TERMINAL ASSET OF ALTERNATIVE	\$1,640
17. TOTAL PRESENT VALUE OF NET INVESTMENT (13+14-15-16)	\$288,420
18. PRESENT VALUE OF LCC SAVINGS (COL. 11)	\$4,740,000
19. PLUS: PRESENT VALUE OF COST OF REFURBISHMENT OF MODIFICATION ELIMINATED	\$14,480
20. LESS: STATUS QDD SALVAGE VALUE	\$0
21. TOTAL PRESENT VALUE OF SAVINGS (18+19-20)	\$4,754,480
22. SAVINGS/INVESTMENT RATIO (21/17)	1.65
23. DISCOUNTED PAYBACK PERIOD	1.5

COSTS ARE BASED ON COMPTROLLER DATA  
AND CONTRACT PROPOSAL DATA

NAME & TITLE OF PRINCIPAL ACTION OFFICER:  
EDWIN FOND, ENGINEERING

DATE  
JANUARY, 1988

SUMMARY OF PROJECT BENEFITS  
SAVINGS IN TIME AND EXPENSE WILL RESULT  
SAVINGS ARE FROM SAME SOURCES AS ARE COST DATA

# PRIMARY ECONOMIC ANALYSIS

1. SUBMITTING ORGANIZATION: FGD, CORPS OF ENGINEERS  
 2. DATE OF SUBMISSION: JANUARY 1988  
 3. PROJECT TITLE: MODERNIZATION OF PUBLICATION FACILITY  
 4. PROJECT OBJECTIVE: PRVD LST CST DOCUMET REPRODUCTION  
 5A. PRESENT ALTERNATIVE: OFFSET PRINT SHOP  
 5B. PROPOSED ALTERNATIVE: COMPUTER REPRD #2  
 6A. ECONOMIC LIFE: PRESENT 25 YEARS  
 6B. ECONOMIC LIFE: PROPOSED 25 YEARS

7.	8. RECURRING ANNUAL OPERATIONS COSTS		9.	10.	11.
PROJECT YEAR(S)	A. PRESENT ALTERNATIVE	B. PROPOSED ALTERNATIVE	DIFFERENTIAL COST	PRESENT VALUE FACTOR	PRESENT VALUE OF DIFFERENTIAL COST
1992	\$850,000	\$210,000	\$0	0.956	\$0
1993	\$850,000	\$210,000	\$640,000	0.917	\$594,740
1994	\$850,000	\$210,000	\$640,000	0.789	\$504,000
1995	\$850,000	\$210,000	\$640,000	0.715	\$456,000
1996	\$850,000	\$210,000	\$640,000	0.651	\$414,000
1997	\$850,000	\$210,000	\$640,000	0.592	\$376,000
1998	\$850,000	\$210,000	\$640,000	0.538	\$341,000
1999	\$850,000	\$210,000	\$640,000	0.489	\$310,000
2000	\$850,000	\$210,000	\$640,000	0.445	\$282,000
2001	\$850,000	\$210,000	\$640,000	0.404	\$257,000
2002	\$850,000	\$210,000	\$640,000	0.365	\$234,000
2003	\$850,000	\$210,000	\$640,000	0.334	\$213,000
2004	\$850,000	\$210,000	\$640,000	0.304	\$194,000
2005	\$850,000	\$210,000	\$640,000	0.276	\$177,000
2006	\$850,000	\$210,000	\$640,000	0.251	\$162,000
2007	\$850,000	\$210,000	\$640,000	0.228	\$148,000
2008	\$850,000	\$210,000	\$640,000	0.208	\$135,000
2009	\$850,000	\$210,000	\$640,000	0.189	\$123,000
2010	\$850,000	\$210,000	\$640,000	0.171	\$112,000
2011	\$850,000	\$210,000	\$640,000	0.154	\$102,000
2012	\$850,000	\$210,000	\$640,000	0.142	\$92,000
2013	\$850,000	\$210,000	\$640,000	0.129	\$83,000
2014	\$850,000	\$210,000	\$640,000	0.117	\$74,000
2015	\$850,000	\$210,000	\$640,000	0.106	\$66,000
2016	\$850,000	\$210,000	\$640,000	0.097	\$59,000
12. TOTALS	\$21,250,000	\$5,850,000	\$15,360,000		\$5,452,620

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# PRIMARY ECONOMIC ANALYSIS (CONTINUED)

13. TOTAL PRESENT VALUE OF NEW INVESTMENT	\$438,377
14. PLUS: PRESENT VALUE OF EXISTING ASSETS TO BE USED	\$4,027
15. LESS: PRESENT VALUE OF EXISTING ASSETS REPLACED	\$7,534
16. LESS: PRESENT VALUE OF TERMINAL ASSET OF ALTERNATIVE	\$1,845
17. TOTAL PRESENT VALUE OF NET INVESTMENT (13+14-15-16)	\$421,763
18. PRESENT VALUE OF LCC SAVINGS (COL. 11)	\$5,433,635
19. PLUS: PRESENT VALUE OF COST OF REFURBISHMENT OR MODIFICATION ELIMINATED	\$140,250
20. LESS: STATUS QUO SALVAGE VALUE	\$533
21. TOTAL PRESENT VALUE OF SAVINGS (18+19-20)	\$5,651,967
22. SAVINGS/INVESTMENT RATIO (21/17)	13.4
23. DISCOUNTED PAYBACK PERIOD	1.7 YEARS

COSTS ARE BASED ON CONTROLLER DATA  
AND CONTRACT PROPOSAL DATA

NAME & TITLE OF PRINCIPAL ACTION OFFICER  
EDWIN FONO, ENGINEERING

DATE  
JANUARY 1980

## SUMMARY OF PROJECT BENEFITS

SAVINGS IN TIME AND EXPENSE WILL RESULT  
SAVINGS ARE FROM SAME SOURCES AS ARE COST DATA

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